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RAIL-ROAD NEWS.

Allegheny Valley Railroad.

The engineers employed to survey a route for this road, from the mouth of the Mahoning to Ridgeway, have made a report that they have examined the route of the proposed road, and estimate that the whole distance by railroad, from the mouth of Mahoning to Olean, would be about 120 miles. This makes the entire length of the new road from Pittsburg to Olean about 180 miles. They calculate on a viaduct 40 feet above low water over the Mahoning at its mouth, and another viaduct 30 feet in height over Redbank.

The Pittsburg Morning Post says that the Railroad from Pittsburg to Rochester, will soon be organized and ready for a fair commencement. The people of Rochester, and the people on the line of the proposed road in this State, have shown their approbation of this undertaking, and only ask the people of Pittsburg and Western Pennsylvania to meet them at the State line. They will do the rest.

According to Galignani, the Emperor of Russia has just ordered 6,000 carriages to be built for the different railways in his empire, in order to facilitate the conveyance of troops.

Arrowroot in Florida.

A correspondent of the Florida Sentinel writing from Dale County, in that State, gives some interesting information in regard to the manufacture of arrowroot there—a business in which he is engaged himself. The plant from which the article is made is known by the Indian name of "Comta." It is indigenous to the State, and grows throughout the pine-wood. Wherever dug, another and more valuable crop soon and spontaneously grows up. Its manufacture has been going on for several years in the State; but although there are now several mills propelled by steam and water, the writer thinks the business is only in its infancy. With the establishments in operation a large number of people obtain employment in digging up the root, which is a business distinct from the grinding and manufacturing.

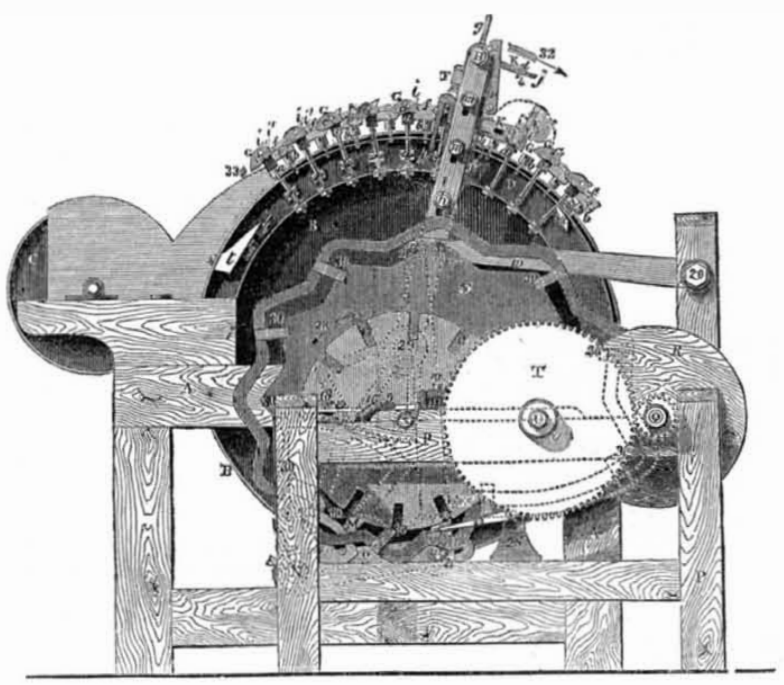
The project of transporting the celebrated Cleopetra's Needle to Hyde Park, to occupy the site of the Crystal Palace, has been renewed.

The steamship Demerara, for the West India line, which stranded on the Bristol river while on her way to Glasgow to receive her engines, had been abandoned to the underwriters. She was insured for £48,000.

This was the largest steamship ever built. Bristol seems to be a great place for making mistakes; witness the Great Britain.

The Swedish Government are about dispatching a ship on a voyage of discovery and circumnavigation with a Scientific Commission on board selected by the Royal Academy of Stockholm.

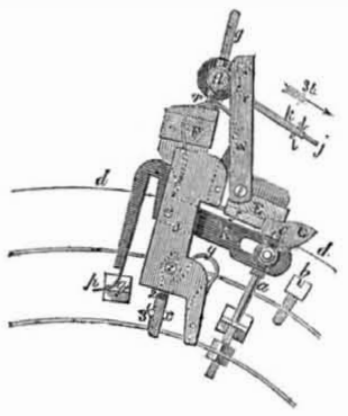
SELF-STRIPPING CARDING MACHINE.---Fig. 1.



The accompanying engravings represent the Self-Stripping Carding Machine, invented by Messrs. Charles D. Wilcox (now deceased), Jonathan P. Sti man, and Amos Stilman, all of Westerly, Washington Co., R. I. In our notices of machinery at the Fair of the Institute, our readers will recollect that we mentioned this machine particularly. Since that time measures have been taken to secure a patent for it, Mrs. Eunice Wilcox, administratrix, acting for her deceased husband.

Figure 1 is an elevation of one end of a carding machine, with the improvements attached. Figure 2 is a side view of the stripper. Fig. 3 is a plan view of the machinery which operates the stripper. Figures 4 and 5 are small parts of the machine, which will be explained hereafter. Similar letters refer to like parts. As there are a great number of peculiar movements in this machine, it will require a long description to give a definite idea of its peculiarities, and at the same time it will demand the closest attention on the part of our readers. The description, therefore, is continued on the Fourth Page.

FIG. 2.



A Self-stripping Carding Machine has been a desideratum; those in common use are stripped by hand. The carding machine represented does not differ materially from other carding machines, except in the mode of attaching the top cards. A A is the framing; B is the main cylinder: D are the arches which support the cards.

This invention relates to certain mechanical means, by which the top flat cards of a single carding machine, or of any number of carding machines, may be stripped, one after the other, in regular succession, while the machine or machines are in operation, without detaching them from the said machine or machines, and without requiring any manual aid—the operation of stripping proceeding during the whole time of carding.

E E are the top cards which are of precisely the same construction as those in common use, but are attached in a different manner, being hinged or jointed by pivots, *c c*, at each end of their front side to the standards, *a a*, which carry them; resting, when in position for operating, upon screws, *b b*, screwed in the arches, but being capable of swinging upwards and forwards, or turning over, so as to lay on the next card in front of it, and present its teeth upwards, (fig. 1), where one of the top cards is in the act of turning over, and fig. 2, where one is represented turned over, the position of the tops or backs of the other top cards being represented on the latter figure by the line, *d d*. Hanging on each of the pivots, *c c*, of the hinges at the end of the cards, is a small tumbler, G, which is divided into two parts, the outer part being visible in figures 1 and 2, and the inner part in figures 4 and 5. The outer part is of nearly elliptical form, and the inner part of nearly the same form, but has a portion of its periphery (indicated by *e* in fig. 4) concentric to the pivot, *c*, upon which it hangs, and has angular projections, *i i'* at each end of the said portion, *e*, (see figs. 4 and 5). The tumbler turns freely upon the pivot, but on being turned a certain distance in either direction, one of the angular projections will come in contact with either the upper or under side of a part of the plate, *f*, of the hinge, which fits close up to the part *e*, and by means of these projections, the top card, to which the tumbler is attached, is turned over to present its teeth upwards for stripping, and returned to its working position.

It is presumed that the construction of the carding machine is now intelligible, and the description of the means by which the top cards are stripped, the means by which the tumblers are operated upon for turning over the cards, and the means by which the stripping apparatus is operated, will now be described.

The stripping is performed by a comb or flat card, F, which is of the same length as, and suspended above the top cards, its teeth being on its under side, inclining downwards in the same direction as those of the top cards incline upwards, when turned up. This comb is secured firmly by screwed rods, *g g*, to a bar, H, which extends across the top of the carding machine, between two sweeps or swinging arms, one on each side, I I, which are hung so as to turn freely on the ends of the shaft, 29, of the main cylinder. The screwed rods admit of the combs being adjusted at a proper height above the top cards: and it can be still further adjusted, as the sweeps, I I, are made in two parts, screwed together by screw bolts, *h*, which pass through slots in one part. In connection with the comb or stripper is a brush, *j*, which may be made of a strip of leather or any soft material, for the purpose of sweeping off the waste stripped from the top cards. This brush is attached to two arms, *k k*, which hang loosely and turn freely on the bar, H, and is confined between metal plates, *l l*, extending its whole length, which is equal to that of the cards. It is capable, by means hereafter described, of being swung or thrown upwards during the operation of stripping, and brought down into position for sweeping off the waste at a proper time.

The mechanism employed for the purpose of turning over the cards, is attached to a plate J, which is attached to the inner face of the front sweep, by screw bolts, *m m*, which pass through slots in the sweep, and admits of its sliding on the sweep; the plate itself is distinctly shown in fig. 2. A lever, K, working on a fulcrum pivot, *n*, secured in the plate, J, carries a stud, *o*, which is adjustable in a slot, and is caused by movements given to the sweep to operate on the periphery of the outer parts of the tumblers. This lever is operated upon two springs, one, *p*, of which is attached to the opposite end to that where the stud, *o*, is placed, the last named end of the lever being being bent in a hook form, and the end of the spring being bent inwards back of the lever, so as to come in contact at certain time, with studs, *q q*, placed around the front arcs of the frame of the carding machine at intervals corresponding with the distance between the top cards; the effect of these studs is to raise the end of the lever carrying the spring, and depress the stud, *o*; this depression being necessary at certain times, which will be hereafter explained, for the purpose of allowing the stud, *o*, to pass under the tumblers. The other spring, *r*, is of a hook or bow form, and is attached to the plate, J, above the lever, bearing upon the lever at the back of its hook, in a suitable manner, to raise the stud, *o*, the stud being prevented from rising too high by a projection—not shown, but easily understood—at the back of the plate, J.

The plate, J, is connected by a link, *w*, to the front arm, *k*, carrying the brush, or to a short lever or arm appended to *k*. The lower one of the screw bolts, *m*, is turned down at its end to form a stud, *x*, which extends some distance through the plate, J, and on this stud hangs a catch, *x*, which has two notches, 1, 2, in one edge at a short distance apart, either of which is capable of catching on a stationary stud, 3, secured in the sweep. A spring, *y*, is secured to the plate, which acts on the catch to keep it on the pin, and while it is so held the plate, J, will be stationary in relation to the sweep. In figure 1, the lower notch is shown on the pin, 3, that being its position during the entire operation of stripping the cards, the brush being raised, but when the cards are stripped, and the waste is to be swept away, the movement of the sweep brings the upper part of the catch, *x*, above the stud, *z*, into contact with a stop, and releases it from the pin, 3, leaving the plate, J, free to slide on the sweep; the stud, *x*, then comes in contact with the incline, *u*, (fig. 1), and in passing along it draws down the plate, J, and with it the catch. The plate, J, draws down the brush by means of the link, *w*, and by the time the brush is drawn into position for operation, the catch, *x*, passes a stop (not shown), and the spring, *y*, throws its lower part forward, and the notch, 2, which is now opposite to the pin, 3, catches

(Continued on Fourth Page.)

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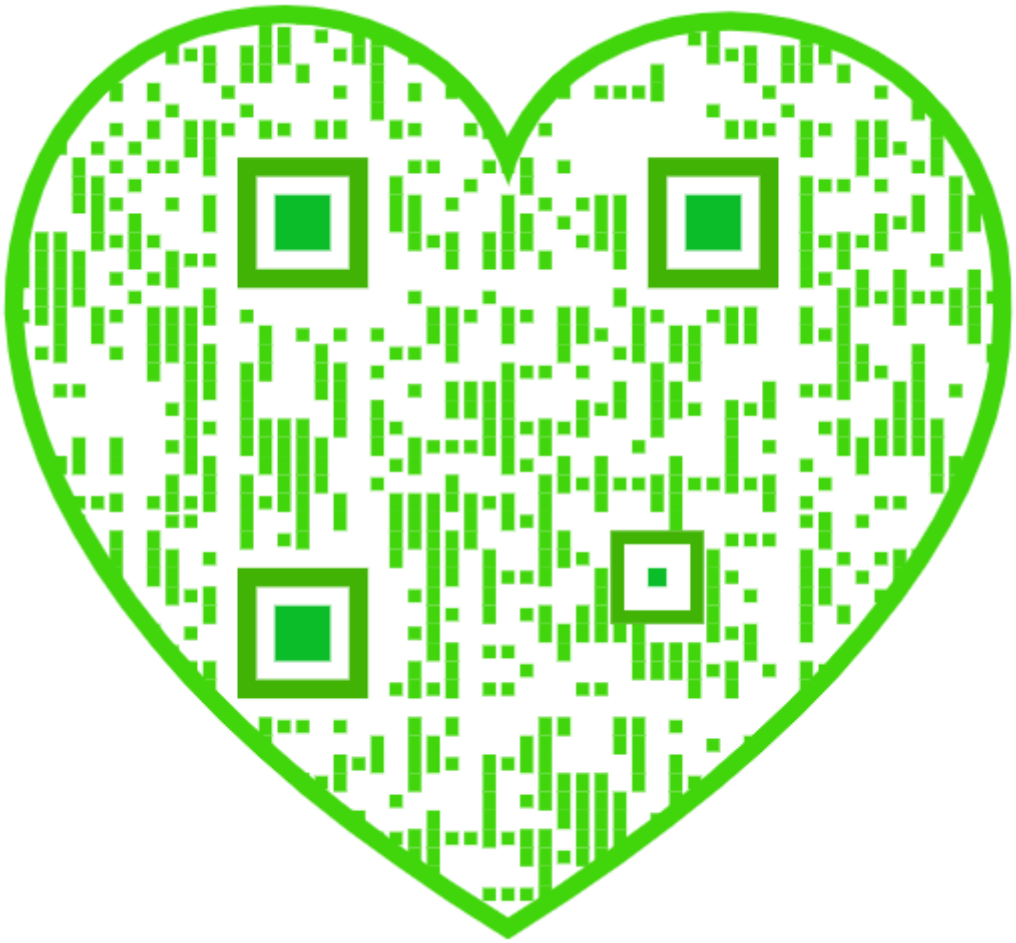

MISCELLANEOUS.

Chemical Analysis of Poisons.

It is well known that without the aid of chemistry, poisoning criminals would not be detected, except upon the confession of witnesses, who knew of and saw the deeds done. The strong evidence relied upon to prove that a person has been poisoned, and by what poison, is that of the chemist. To show how accurate the knowledge of a chemist is in respect to detecting poisons in the human system, we adduce the testimony of Dr. Reid, in the case of Otto Grunzig, tried for poisoning his wife in this city.

Lawrence Reid, professor of chemistry, sworn and examined by the District Attorney, deposed—I am attached to the City Hospital, Broadway; I have devoted myself to chemistry for 25 years; I was called upon to analyze a part of the body of Victorine Grunzig, in August last; Mr. Bleakly, the Assistant Coroner, brought me portions of the body which he told me were those of Victorine Grunzig; I wrote her name down; the parts were the stomach, with some fluid said to be part of the contents, the heart, a portion of the liver, and part of the lungs; I put them to chemical process; in those parts I did not discover any traces of mineral poison; I was afterwards furnished with other parts of the body of Victorine Grunzig; I cannot recollect what time it was; the other portions were the whole of the liver, all the intestines, the spleen, the other kidney, and the other portions of the lungs; I subjected them to a chemical examination; I heated them with sulphuric acid, for the purpose of detecting the organic matter; then burnt the substances, and placed it in an apparatus which generated hydrogen gas; the gas was inflamed, and upon intercepting the flame with a clean porcelain vessel, a slight indication was given to the porcelain, which, I supposed, was arsenic, but the quantity was so small that I cannot speak positively; it is called Marshe's test which I applied; I accompanied Mr. Bleakly to premises in Eldridge street; the number I do not know; I saw Mr. Bleakly scraping portions of the floor in the front room; he gave them to me; I was not present at the scraping of the floor in the back room; I suggested that all the medicines should be examined; this was after I analysed the contents of the body; I afterwards subjected the medicines to chemical tests; I did not discover in them any mineral poison; I analyzed the scrapings of the front room, and found mineral poison [pieces of porcelain produced with traces of metallic arsenic] one is the result of the scrapings of the floor of the second room; it is metallic arsenic.

Q.—Assuming the substance or the appearance in the second analysis you made to have been arsenic, what portion of a grain would you say was in it?

A.—I should say that it was less than a millionth part of a grain; I found about fifteen different medicines in the room; I examined them, and found no poison in them.

Arsenic sometimes produces a local inflammation and a diseased state of secretion; when arsenic acts as a slow poison, there is great difficulty in detecting it; but we then judge by the effects it produces.

I did not find any copper in the water in the stomach; I did not look for copper; the same tests would not show copper if it had been there.

The Court—What becomes of the mineral itself?

A.—It is supposed to pass off in the urine: I could not state what time it would take to pass off; some substances pass off immediately—for instance, turpentine; liquid passes into the kidneys, in about an hour; if arsenic was taken, I don't see why it should not pass off within twenty-four hours; I would rather say that it "might" pass off.

The accompaniments of the symptoms are pains in the bones, nausea, sickness, heat in stomach, and irritation of the throat; I believe delirium accompanies the advanced stage of persons under the effects of poison.

On last Friday the jury returned a verdict of "guilty of murder." He was convicted by the testimony of unerring science.

Recent Foreign Inventions.

Leather made from Scraps.—Mr. P. Webley, of Birmingham, England, has recently obtained a patent for the following method of using scrap leather:—It consists in forming a composition of scraps, or pieces of leather with gutta percha or caoutchouc. The scraps or cuttings of leather are first well washed in warm water, then taken out and partially dried, then steeped for a time in a solution of size or glue until fully saturated; it is then placed in a box or trough, the bottom and sides of which are perforated with holes to allow the escape of the superabundant portion of the solution. While in the box it is submitted to a very considerable pressure; it is then taken in the state of a hard block to a cutting or rasping machine, which consists of apparatus arranged and worked somewhat like a chaff-cutting machine. By this operation the composition is reduced to fine scraps or shreds; it is then steeped in warm water and well washed, to remove the glue. The washed shreds are then combined with melted gutta percha or cautchouc in proper proportion, and reduced to a state of sheet or plate, by passing it between rollers to any desired degree of thickness, for the purposes required, and then used for many purposes to which ordinary leather is applicable.

Artificial Fuel.—M. Pierre A. Le Comte De Fontainmoreau, of London, has recently obtained a patent for the following method of making artificial fuel:—The materials described as being employed, are the small branches of trees, annual plants, and the refuse portions of ligneous substances generally, such as tan-bark, sawdust, &c., and combining these with coal-tar, or other similar fluid or semi-fluid inflammable materials. The ligneous materials selected for the purpose are first submitted to a carbonizing process. This is conducted very much in the ordinary manner. The materials being carbonized, are pulverized and reduced to a state of powder by a mill, consisting of a pair of edge-cones attached to a vertical shaft, and operating in a similar manner to a pair of edge-stones revolving within a circular trough; the apparatus is provided with rakes and scrapers, and when the material is properly pulverized, it is discharged from the trough by an aperture provided for that purpose.

The pulverized material is now mixed with a proportion of coal-tar or other fluid or semi-fluid inflammable material; this operation is performed in a trough, within which a pair of running edge-cones are working. The materials being thoroughly mixed together, they are submitted to the moulding operation, in which a considerable degree of pressure is employed to force the materials into cast-iron moulds of the form desired. The machine consists of a cross-head. to which a number of moulding or pressing rods are attached in a vertical direction; side connecting rods are attached to the cross-head, and to a cranked-shaft below, and by the rotation of the shaft a reciprocating vertical movement is given to the cross-head; thus when it descends, the moulding-rods will be forced into the moulds beneath, and compress the materials placed therein. The compressed and moulded materials now constitute a firm hard compact fuel, not liable to breakage or crumbling from being moved about. The compressed lumps are then submitted to the last process, which is that of complete carbonization. The lumps are arranged upon an iron carriage, and then introduced into a carbonizing oven or kiln, maintained at a high temperature until all the vapor or gases are driven off; they are then removed and allowed to cool.

We are indebted to our invaluable exchanges, "Newton's Repertory of Arts," "Patent Journal," "Mechanics' Magazine," and other London Journals," and to the "Genie Industriel," &c., of Paris, for the above, in substance.

Mr. Steers, the designer and constructor of the yacht America, has been elected an honory member of the New York Mechanics' Institute. This is an honor conferred upon those only who have invented and constructed some work of great merit. Mr. Steers has been the means of bringing great honor to this country as well as to himself. The Institute has done all that it possibly could do to test fy its admiration of his abilities. We hope the testimonial designed by some of our citizens to show the sense of "the services done the State," by Mr. Steers, will soon be forthcoming and as handsome as it is well deserved

The Gold of California.

The steamship Cherokee arrived at this port on last Saturday evening, and brought two millions and a half of gold dust. The gold discoveries instead of decreasing, were on the increase, and the number of emigrants to San Francisco was greater now than ever.

An extraordinary cave had been discovered about six miles from San Antoine, which had been entered and partially explored to a distance of over 1,400 feet. It is described by those who have seen it as being divided into countless chambers and apartments, all of easy access, adorned with curiously shaped figures of stone, making them resemble well furnished rooms; and from the ceilings hanging pendant in huge masses, bright crystals, flashing the light of torches, give the appearance of gorgeous chandeliers suspended from a richly-furnished dome, to shed their lustre upon the magnificence that lies scattered around; while in some of the apartments, floor, walls, and ceilings, reflect back such a flood of light from innumerable stalactites, as to be almost blinding. There is a general and regular descent to the cave of about 35 degrees.

Pickling Meat.

Prof. Refiensque denounces the use of saltpetre in brine intended for the preservation of flesh to be kept for food. That part of the saltpetre which is absorbed by the meat, he says, is nitaic acid or aquafortis, a deadly poison. Animal flesh, previous to the addition of pickle, consists of gelatinous and fibrous substances, the former only possessing a nutritious virtue; the gelatine is destroyed by the chemical action of salt-petre, and, as the professor remarks, the meat becomes as different a substance from what it should be, as leather is from the raw hide before it is subjected to the process of tanning.

He ascribed to the pernicious effects of the chemical change all the diseases which are common to mariners and others who subsist principally upon salted meat—such as scurvy, sore gums, decayed teeth, ulcers, &c.—and advises a total abandonment of the use of saltpetre in the making of pickle for beef, pork, &c., the best substitute for which is, he says, sugar, a small quantity rendering the meat sweeter, more wholesome, and equally as durable.

American Ship-Building.

The following is the acknowledgment made by Wilson Green, Esq., at the dinner on board the packet-ship Great Western, in answer to the toast, "The Liverpool Ship-builders." After speaking of ship-building generally, and what could be done in America, Mr. Green said,—

"That the Americans had advantages which they did not possess in England, and it must be acknowledged that their ships are amongst the noblest specimens of naval srchitecture, and could not be rivalled. He thought, however. that if in Liverpool we had the advantages which they had in America, we might compete with them; he would not say they could beat us, but we should first have a trial. He would say this, that in almost every thing connected with ships the Americans were leading us. [Hear.] They had a class of steamers which came here from the United States. Now, as a ship-builder, and one acquainted with building large steamers, he did not hesitate to say there were not finer or better built vessels than the American steamers. [Hear, hear.] The Atlantic had sustained a succession of severe gales, which few ships could have withstood, and when she was examined in the dry-dock at this port, there was not the slightest appearance of any strain. She exhibited what he never saw before. It was well known that ships of war invariably settled about five inches; but the Atlantic did not vary an inch and a half. [Hear, hear.] There was not a frigate in the English navy that would not sink five inches. The sinking was shown by the copper; but there was not the slightest abrasion in the Atlantic. He hoped we should go on with America in the spirit of honest rivalry; and he begged to propose as a toast—'The Ship-builders of the United States of America.'"

The Steamship Great Britain.

This magnificent vessel is now ready to receive her engines. She is to have six boilers, three on each side, and two funnels, abreast of each other. The alterations in the ship have added materially to her appearance, and they have also increased her capacity. By means of the new deck house the ship will be able to carry coals for the voyage out and home, about 600 passenges, and 3,000 tons of measurement goods; whilst her engines, which are nominally of the same power as before, but really more efficient, will give her a higher speed. The new screw is now fixed in its place. Its diameter is 15 feet 6 inches, and its pitch 19 feet.

The rudder post may be termed a bar of iron firmly secured to the keel behind the propeller, and rising to the iron work above the upper end of the rudder post, inclining backwards. If any one will take a walking stick, and hold it in a sloping direction just a few inches out of the perpendicular, it will show the position of the rudder post in the ship. Then again, at the top of the rudder post, it takes a sharp curve inward into the framing of the ship, forming an acute elbow similar to the crook of a walking stick. The rudder post is turned at different diameters, tapering downwards, so that the rudder cannot get fast by working down. And into the crook of the rudder post a steel pin has been inserted upon which the rudder rides or turns. The rudder itself, that is, the movable part of it, consists of an iron frame, plated with sheet iron. The action of the rudder is partly upon the steel pin of which we have spoken, and partly upon the rudder post, which it is made to encircle; and vibration is prevented by a portion of the rudder being made to project forward of the rudder post.

Circular Saws.

Mr. Editor—I have long used circular saws, and much as I like them for some kinds of work, there are difficulties attending the running of them—I mean those of a larger size—which I have never been able to obviate, although I have tried many plans to do so. The difficulties are the heating of the saw, and the liability of it to depart from cutting in a straight line, thus making bad work. I write to learn if there is any proper remedy for these evils. I am not alone respecting the difficulties, which I have mentioned. A remedy for them would be of great benefit to hundreds of persons engaged in the business and a knowledge of which, if any exists, would do harm to no one. I write this in the hope that you or some of your readers may be able to give the desired information. R.W.W.

Florida, 1851.

[We have been informed that a remedy against injurious heating of the saw, has been provided in many instances, by lessening the number of teeth in the saw. There are many apparently small things existing, either as benefits or defects, which render machines useful or useless, which no theory can discover or point out. These belong to practical mechanism, and the attentive observer is the man who is the Seer for such things. It is impossible for one man, or a thousand men, to know about *all* these things, but we are confident that some of our readers do know, for they are neither few nor far between, and we also know they are of the right stamp to consult in such cases. We hope some of them will give the public the benefit of their knowledge respecting the practical information so much desired. —[Ed.

Improved Blacksmiths' Tuyeres.

Mr. Henry Kern, of Woodstock, Shenandoah Co., Va., has taken measures to secure an excellent improvement in Tuyeres for blacksmiths' fires; it consists in providing a circular cast-iron box, having four nozzles on its inner side, pointed towards the centre of the fire, this box being situate on the circle of the fire, and connected with the bellows; it therefore forms a wind-chest, which conveys the wind from the bellows, through the nozzles, to the fire. This produces an even heat throughout the whole breadth of the fire, something which is of no small importance. It is well known that, for heating the tires of wheels, this improvement will be of great value.

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For the Scientific American.

Electro-Magnetism as a Motive Power.

Much has been said in disparagement of this power as a prime mover; it has been urged that it is more expensive than steam power, I know of no instance where it has been attempted to prove that it could be made a power as cheap as steam; I would therefore throw out the following observations to the future experimenter in this branch of the arts:—At present the metal used to produce galvanism is zinc, which, being dissolved by sulphuric acid, produces sulphate of zinc, an article of little commercial value. But if we could use some other metal, the residue, or salt, of which would be of some intrinsic value, we might, perhaps, reduce the cost of electro-magnetism to a mere cypher.

Faraday has demonstrated that the amount of galvanism which any battery produces is in exact proportion to the amount of metal consumed; Prof. Hare is of the opinion that we cannot produce galvanism of any practical utility without the consumption of some metal, chemical decomposition is absolutely necessary to produce galvanism, and the power of that galvanism depends on the quantity and the rapidity with which that metal is consumed. Liebig seems to despair of electro-magnetism ever taking a prominent position as a prime mover.

For certain purposes, I admit, it will never be used to advantage, as, for example, in steamships or railroad cars, for the very reason that Liebig advances, namely, that one pound of coal produces as much mechanical power as thirty-two pounds of zinc. It is not the expense, but the bulk and the weight of the metal to which I object, for it would require four and four-sevenths times more room to stow away enough zinc to produce as much power as coal, besides being thirty-two times heavier. But for stationary engines, I believe electro-magnetism will, some day not far distant, take the place of steam. It so happens that hitherto the arrangement of the battery has been such, that the salt formed by its action is of no value. In the construction of a galvanic battery, two things ought to be kept in view, viz., economy and power; the former has been sadly disregarded, all the ingenuity of the inventor has been bestowed upon the latter.

I have constructed a battery in which silver takes the place of the zinc, and intric the place of sulphuric acid, the salt formed by this battery—nitrate of silver, is of much use in the arts, and is worth as much as the silver and the acid used in its production, leaving the galvanism produced a net profit.

Mr. Joule has proved that 45 pounds of zinc consumed in a Groves' battery, in 24 hours, are capable of producing one horse power; 45 pounds of zinc, dissolved in sulphuric acid, yield 99 pounds of sulphate of zinc. From the researches of Faraday, it appears that the quantity of the voltaic fluid given out during the solution of various metals, is in the ratio of their atomic weight; accordingly it will require 30·9 pounds of silver to produce the same effect. Now 30·9 pounds of silver will yield 46·69 pounds of nitrate, which is worth $1,12 per ounce, making the salt produced, in a one horse-power engine per day, worth $627, 50. Coin silver is worth $1,16 per ounce, accordingly 30·9 pounds of silver are worth $430, leaving a balance of $197,50; my battery consumed 3 dwts. of silver and one ounce of acid in 24 hours; nitric acid is worth $1,12 per pound, accordingly $24,68 worth of acid will be required per day to work the engine leaving $172,71 to pay for collecting and casting the nitrate into sticks ready for market.

Using mercury and muriatic acid instead of silver and nitric acid, corrosive sublimate was formed, and I have no doubt that many other arrangements can be made in the battery, producing a number of salts, useful as paint, medicine, and for dyeing.

Dr. Boyton has demonstrated that muscular motion is produced by electro-magnetism, and that the brain is the galvanic battery; the nerves the conductors, and the muscles the electro-magnets. Now, if we for a moment contemplate the animal system, we are astonished with the immense power which this small battery exercises, for it is not merely the work which an animal can do that measures its power, but by far the greatest part of its power is consumed in re-production and respiration. Hoffman and Haller say that the heart alone pumps out about seven tons of blood per day.

In the construction of electro-magnets, too, little regard has been had to nature; the muscle of the animal consists of many hundred small fibres; these fibres are hollow tubes, containing many thousand minute globules, only visible by the aid of the microscope, these globules are composed of about 90 per cent. of iron, and are encircled by a nerve, and the galvanic circuit being closed by the will, are rendered magnetic and attract each other, thereby shortening or contracting the muscle. On the circuit being broken, the muscle is again restored to its former position, thereby producing animal motion. It is singular that nature should construct her electro-magnets globular instead of the shape of the horse-shoe, as man has done, the question arises, which of the two is the proper form? I am inclined to think that the former is the best; the matter contained in two globes can be brought into closer attractive proximity, than the same quantity of matter can be brought in any other mathematical figure, and as the power of electro-magnets is rapidly diminished by being drawn asunder; that is to say, gravity is diminished as the square of the distance is increased, but magnetism is decreased in a much more rapid degree. According to R. Hunt, a magnet, in contact with an armature, lifted 220 pounds; when separated only one-fifth of an inch, it was only capable of lifting 40 lbs. It is also necessary that the electro-magnets be made very small, making a powerful magnet by the combination of numerous small ones instead of very large ones. J. F. Mascher.

Philadelphia, 1851.

[For the Scientific American.]

Remarks on Inks.

It is important to have good ink, and as your paper is the best medium for communicating information of this kind to the public, I will make a few remarks of useful import.

The best nutgalls are externally of a dark lead or bluish color. When broken, the internal surface is "brownish, hard, solid, brittle, with a flinty fracture, and a small spot or cavity in the centre, indicating the presence of the undeveloped or decayed insect." Inferior galls are lighter, both externally and internally, sometimes reddish or nearly white, of a loose texture, with a large cavity in the centre, often communicating externally by a small hole, by which the fly has escaped. As it is often the most worthless kind of galls that is kept ready ground for sale, they should not be bought in that state. The poor galls are unfit for making good ink, as I have ascertained by many experiments. It is better not to boil the galls.

Logwood is often added to ink to give it a purple cast, though it soon turns to a brownish black, (about the same color as galls). It is generally thought not to be so permanent as galls, but my experiments, made twelve years ago, with logwood, in place of galls, do not show any fading. Cheap inks are also made with oak bark, &c.

Several of the salts of iron will make ink: the best is the sulphate (green copperas). The copperas of commerce, though not pure, is generally near enough so for our purpose. The crystals only should be chosen. Copperas, by exposure to the air, effloresces, that is, loses its water of crystallization, and falls into a dirty white powder; the iron, or part of it, at the same time, passes into the peroxide. The same effect can be produced by calcining it; the powder and galls will make a black ink at once, but for reasons which will be explained, the green sulphate is much preferable.

One part of green copperas to two parts of galls, I believe to be the right proportion for durability. If the galls are increased (the other articles remaining the same) to three or four parts, the ink appears to be very little, if any stronger. When the copperas is increased up to equal the galls, the color, too, is somewhat increased. More copperas than this adds nothing to the color, and is hurtful. Lewis, and some others, recommend three parts of galls to one of copperas, on the supposition that the iron, being stronger than the gallic acid, overcomes it after some years, and the ink fades for want of a larger proportion of the gallic acid. As only about one-fifth of the weight of green copperas is iron, it will be seen that when metallic iron is used, it must be diminished somewhat according to that proportion. Cast-iron, steel, scales of iron, iron rust, &c., will not answer. It must be wrought-iron, (turnings or fine wire) and vinegar, or some vegetable acid used with it.

It was recommended by Lewis to add a piece of metallic iron to the ink, probably with the view of its taking up any free sulphuric acid which might be in the copperas. A very small piece, or a few filings might be beneficial, but too much is too much, even of iron.

A small proportion of the sulphate or of the acetate of copper, seems to add somewhat to the intensity of the blackness of new ink, but it causes a considerable precipitate, and I think on that account it is best left out.

Gum arabic or senegal, and sometimes sugar, is used to assist in keeping the coloring matter suspended, to prevent the ink from spreading, and to give a it lively appearance.

Clean rain water has no lime or other saline impurities in it, and therefore should always be preferred to well and spring water for making ink. The rain that falls in the first part of a shower, after a dry time, is not so clear as what comes afterwards. Water is the only fluid necessary, but the substitution of a small proportion, say one-fourth part of vinegar, will do no harm. A large proportion makes the ink strike too deep into the paper, and disposes it to spread. Stuff, called vinegar, sharpened with oil of vitriol or the like, is of course destructive to ink.

When the ink is made strong, there is a less proportion of sediment than when diluted. To prevent ink from moulding, add two grains of corrosive sublimate to each pint, previously dissolved in a little spirit. Arsenic, I suppose, would do as well, as both of these poisons are destructive of vegetation (mould).

For a permanent black ink, I suppose the following recipe is equal to any:—

Blue galls, pulverized, 8 ounces.

Gum arabic, 8 ounces.

Green sulphate of iron, 4 ounces.

Rain water, 6 pints.

An ink which I have made for several years, and found to give very general satisfaction, is as follows:—

4 lbs. galls, bruised. 2½ lbs. copperas. ¼lb. extract of logwood. 1½ lbs. gum arabic. 8 gallons of rain water. All put together in a non-metallic vessel, and shaken or stirred with a wooden stick several times a day for two or three weeks; then, after settling, decanted and poured into bottles and tightly corked. If the ink is warm when put in the bottles, they may be filled up so as to leave very little air in them without danger of their breaking.

When first poured from the bottle this ink is quite pale; but, on exposure to the air, it soon acquires oxygen, thickens up, and becomes black; and, at the same time, the blackness is disposed to separate from the liquid, and settle to the bottom; hence Japan ink, or ink already black, is not the best for writing with, for the coloring matter, instead of being in solution, is precipitated, or merely suspended in the liquid by means of the gum arabic, and unless it is frequently shaken, a considerable portion of the strength is at the bottom of the inkstand. It is therefore better to write with the ink in its pale or unoxigenized state, as from its thinness and clearness it flows freer, makes a cleaner mark, and looks better on paper. In a few hours after the writing it shows a strong color, and in a few days it is perfectly black, and you are assured of its remaining so, for the whole strength of the ink is there. All you want at the time is color enough to see to write by, and there will always be peroxide of iron enough in the copperas for that.

Blue Ink.—Much of the prussian blue of commerce will not make blue ink, unless it is digested in muriatic acid and washed. The right kind is now called Paris blue; it is of a deep, rich, purple color, when dry; 1 oz. of it, and ¼ oz. oxalic acid, and 3 pints of rain water shaken together, will at once make a good blue ink. I have found gum arabic worse than useless, as it causes a sediment.

Red Ink.—If you can get the right article of Brazil wood the following will make a pretty ink.

Boil 4 oz. of ground Brazil wood in two pints of good vinegar down to 1 pint, strain, and add ½ oz., each of powdered alum and gum arabic, and if you wish it still more glossy, ½ oz. loaf sugar.

A pale green ruling ink is made of 1 oz. powdered verdigris, ½ oz. cream tartar and 8 oz. water. A. D. Sprout.

Chillicothe, Ohio.

Curious Effects of Excitement.

"My head is gray but not with years."

"A young man, twenty three years old, came from the mines to San Francisco, with the intention of soon leaving the latter place for home. On the evening of his arrival, he with his companions, visited the gambling saloons. After watching for a time the varied fortunes of a table, supposed to be undergoing the process of 'tapping' from the continued success of those betting against the bank, the excitement overthrew his better judgement, and he threw upon the 'seven spot' of a new deal, a bag which he said contained $1,100, his all—the result of two years' privation and hard labor—exclaiming, with a voice trembling from intense excitement, 'My home, or the Mines.'

As the dealer slowly resumed the drawing of the cards, with his countenance livid from fear of the inevitable fate that seems ever attendant upon the tapping process when commenced, I turned my eyes upon the young man who had staked his whole gains upon a card; and never shall I forget the impression made by his look of intense anxiety, as he watched the cards as they fell from the dealer's hands. All the energies of his system seemed concentrated in the fixed gaze of his eyes, while the deadly pallor of his face bespoke the subdued action of his heart. All around seemed infected with the sympathetic powers of the spell—even the hitherto successful winners forgot their own stakes in the hazardous chance placed upon the issue of the bet. The cards are slowly told with the precision of high-wrought excitement. The seven spot wins. The spell is broken—reaction takes place. The winner exclaimed with a deep drawn sigh, 'I will never gamble again,' and was carried from the room in a deep swoon, from which he did not fully recover until the next morning, and then to know that the equivalent surrendered for his gain was the color of his hair, now changed to a perfcet white."

[The above is from the Boston Medical Journal, which would not surely publish a fiction. We have heard of a number of such cases, but have always been skeptical about them, because we never saw a person who was so transformed.

Great Discovery of Lead Ore.

The Galena (Ill.) Advertiser gives an account of the discovery of lead ore, which promises to surpass anything of the kind on record. It was made about two miles northeast of the Linsipheur Mound, is two miles distant from any other diggings, on a farm in the prairie, and was made by a boy finding mineral in a creek. "On examining the bottom of this creek, it was found to be almost a solid mass of lead ore for some ten or twelve feet in width. Some three or four holes have been sunk about four feet in the clay, on each side of the creek, and specimens of large block mineral taken out, weighing from fifty to one hundred pounds. This ore lies between the clay and rock, forming a horizontal floor, and has been proven on one side of the rock for fifteen feet in width. This discovery may be considered as a new feature in the developement of the resources of these mines—it being in a district of country that has been laid open, on the prairies, till the last few years, and was not considered as mineral ground by a majority of the old miners, and it adds another evidence to prove how little is known of these mineral formations. It is impossible to estimate the probable value of this discovery. There is none of that change of ground on either side of this discovery, which has invariably terminated the veins of ore throughout these mines, and there is reason to believe it lies immediately between Hazel Green and North Fairplay diggings, and that it is an east and west vein, forming a link in the subterranean network of veins, connecting these two mining districts.

By the latest news the Crystal Palace was still standing and many hoped it would be permitted to do so.

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Self-Stripping Carding Machine.

(Continued from First Page.)

on it and holds the plate down, and keeps the brush in position for operation. The incline, *t*, is for the purpose of throwing up the brush again, the stud, *z*, passing upon it after the waste is swept from the cards; no stop is shown in connection with *t*, to release the catch as it can be dispensed with.

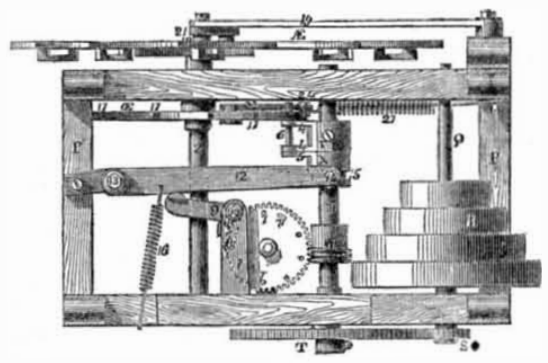
The operation of stripping, and all the operations connected with it, are performed by the movements of the sweeps, I I; the means by which these movements are produced will now be described:—

Attached to the sweeps or to their hubs are toothed sectors, L L, in dotted lines, figure 1, which gear into other toothed sectors, M M, secured upon a shaft, N, below the main cylinder; these sectors are shown. All the mechanism which has now been described requires to be attached to every carding machine to which the improvements are applied: but the remaining portion of the mechanism which is yet to be described, will serve for as many carding machines as can stand in one line, if their shafts, N, are all connected, and may serve for a still greater number by adding gearing to give the necessary motions to the shaft, N. The sectors, M M, receive their motion through a lever, O, which is secured upon their shaft, the motion being communicated to the lever by a train of mechanism upon a frame, P P, which is distinct from the frame of the carding machine; of this train of mechanism, Q, is the driving shaft, receiving motion through a band running over the pulley, R, and communicating the same through a toothed pinion, S, and wheel, T, to a shaft, U; on this shaft is secured a boss, V, having two arms, 4 4, and also an endless screw gear, W; and fitting loosely on it there is a boss, X, having one projecting arm, 5, to which, parallel with the shaft, is secured a stud, 6, which passes through holes bored in the arms, 4 4, and causes the boss, X, to revolve with the shaft; this stud, 6, when the bosses are close to each other, projects beyond the back face of the fixed boss, V. The endless screw gear, W, gears into a toothed wheel, Y, on a vertical axis; this toothed wheel carries on its upper face a number of vertical studs, 7,7, corresponding with the number of cards in the machines. Each of the studs, in its revolution with the wheel, comes in contact with a stud, 8, secured to one end of a bent lever, 9, whose fulcrum, 10, is in an arm, 11, secured to the front top rail of the frame. The opposite end of the lever to that carrying the stud, 8, bears against the side of a lever, 12, which works on a fixed fulcrum, 13, and is furnished at its end with a pin or stud, 14, which fits in a groove, 15, in the boss, X. A spring, 16, is attached to the lever, 12, and to the frame, which always keeps it forward, and slides the boss, X, on the shaft, U, so as to bring the end of the stud, 6, within the back arm of the fixed boss, V, and leave none of it projecting through excepting at such times as the studs, 7, 7, are bearing upon the stud, 8, when the tension of the spring is overcome and the lever, 12, is forced back by the bent lever, 9, so as to slide the boss, X, forward, and cause the stud, 6, to project beyond the back arm of the fixed boss. At a suitable distance from the shaft, U, and parallel with the said shaft, there is a shaft, Z, which carries a circular disc, Œ, having a number of slotted openings, 17, 17, in its periphery, the number of the said slotted openings being two more than the number of cards in the machine or machines. Upon the same shaft, Z, at the extreme back end, outside the frame, P P, there is a cam, Æ, in which there is a slot extending all round, and in this slot works a stud, 18, which is secured in one end of an arm, 19, whose opposite end is hung on a fixed pivot, 20, secured in a post of the framing. The stud, 18, is connected by a rod, 21, to a stud, 22, which is secured, but adjustable in the lever, O, on the sector shaft, N. In the slot in the cam, Æ, there are a number of undulations or steps, the number being one more than the number of cards on the machine or machines, and the said undulations or steps being of suitable form to give the required motion through the stud 18, rod, 21, stud, 22, lever, O, and sectors, M M and L L, to the sweeps to turn over or open, strip, and close every card in succession—to perform which there is one undulation or step, 30, for every card, and afterwards to return the sweep ready again for commencing operation, to perform which there is one greater undulation or step, 31; the latter undulation or step is shown by dotted lines, as are also all parts of the slot that are concealed. The cam, Æ, receives a part of a revolution every time one of the studs, 7, on the wheel, Y, comes into operation on the stud, 8, of the lever, 9, and causes the stud, 6, to move backward, as every time the stud, 6, is forced forward it is brought, by the revolution of the shaft, U, into one of the openings, 17, of the disc, and caused to give part of a revolution to the disc. In order to hold the cam steady at those times when it is not in motion, a pawl, 23, is hung on a pin, 24, in a standard, 25, below the disc, and a lever, 26, is attached to the pawl, and connects by a spring, 27, to the frame; the spring acting on the lever holds the pawl up and causes it to catch in one of the slot openings, until the stud, 6, is coming into operation on the disc; the said stud, 6, previous to entering an opening comes into contact with the lever, 26, and throwing it forward, releases the pawl, and holds it clear of the disc, until it is itself leaving the disc, when the spring, 27, is allowed to operate.

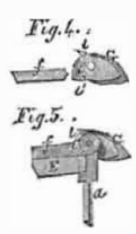
The several parts having been described, and their duties explained, we will proceed to explain the manner in which their operation is conducted.

The carding process is the same as in other

Figure 3.



carding machines, therefore it is not necessary to describe it. We will suppose the operation of stripping to commence with the first card or the one nearest the doffer. The sweeps must be brought to their most forward position, which would be to the left hand in figure 1; the cam, Æ, would then be in such a position as to bring that part of its slot marked X′, to the stud, 18. As it is only necessary that the top cards should be stripped at certain intervals—say once in fifteen minutes—the cam is not required to revolve continuously, but only to move a sufficient distance to cause one card to be stripped, at such intervals as to make each entire revolution occupy that space of time. The driving pulley revolves continuously, and so do the shafts, Q and U, and the wheel Y; but as the stud, 6, is drawn forward by the lever, 12, and spring, 16, except when a stud, 7, is in contact with the stud, 8, under the bent lever, it (the stud, 6) passes the disc, Œ, without touching it, until a stud, 7, acts on the stud, 8, and bent lever, 9, and drives back



the lever, 12, and stud, 6, after which the stud, 6, as it revolves, comes into a slot in the disc, and gives part of a revolution to it and the cam; the distance moved by the cam being just sufficient to make one undulation or step, 30, pass the stud, 18. As the first or rising part of the step passes the stud, 18, it raises it, and the rod, 21, raises the lever, O, which causes the sectors to give motion to the sweeps in the direction of the arrow, 32, in fig. 1.

As the sweep moves, it brings the stud, O, on the lever, K, in operation on the upper side of the front part of the tumbler, G, of the first top card, E, and carries it up or along it, depressing the forward end of it and bringing the angular projection, *i*, to bear under the hinge plate, *f*, causing the top card to be opened or thrown upwards. Almost as soon as the stud, O, commences running up the tumbler and depressing it, the spring, *p*, at the hooked end of the lever, K, runs over the first stud, *q*, on the arch, D, and raises that end of the lever depressing the stud, O, and causing it to throw down the tumbler still further, until at last it (the stud) turns the tumbler so far round as to turn the top card completely over with its teeth upwards and then pass under it. The turning over of the top card is illustrated in figs. 1 and 2; fig 1 showing one of the cards in the act of turning over, and fig. 2 showing it turned completely over; all the cards except the first one fall over on the next card in front; the first one falls on a screw, 33, provided to receive it. The sweep moving on after the card is turned over, carries the comb, F, past it, but owing to the inclination of the teeth it does not yet strip it. By this time the comb has passed the card, the cam has brought the stud, 18, to the top of the undulation or step, and it then causes it to descend the opposite or falling side, which depresses the rod, 21, and lever, O, causing the sectors and sweeps to return a short distance. During the return of the sweep, the comb strips the waste from the open top card, and as soon as it has passed it, the pin, O, (the spring, *p*, of the lever, K, having previously passed over the stud, *q*,) is brought into operation on the tumbler so as to make the angular projection, *i*, act on the upper side of the hinge plate and throw over or close the card. By this time the cam has turned so far, that the stud, 18, will have descended the falling side of the first step, or undulation, and at this moment the stud, 6, will, by its revolution, become free from the slot in the disc, and the disc and cam will become stationary, the stud, 7, will also work clear of the stud, 8, and the spring, 16, will draw forward the lever 12, and draw the stud, 6, forward so that it will not gear into the disc until the proper time for stripping the next card. The waste is deposited on the top of the machine, and on the backs of the cards, and should any hang in the comb it is loosened by the next top card as it passes over it the first time, preparatory to stripping it. When the next stud, 7, on the wheel, Y, acts on the stud, 8, of the bent lever, 9, the cam will make another movement and carry the pin, 18, over the next undulation or step, 30, this will bring the sweeps, I I, and their appendages, including the comb, in operation on the next card, and turn or open it, strip, and return or close it, in precisely the same manner as the first. Thus the operation proceeds, every step, 30, of the cam causing a card to be stripped, until the cards have all been acted upon, and the commencement of the long undulation or step, 31, arrives at the stud, 18. One of the studs on the wheel, Y, marked for distinction, 7′, is elongated in the direction of its revolution, so that it remains in contact with the stud, 8, on the bent lever, 9, for a considerable time, long enough to cause the stud, 6, to operate in two slots of the disc without being withdrawn forward; it being necessary to give two movements of the same length as all the others to the disc and cam, in order to carry the whole of the step, 31, past the stud 18. As the first or ascending part of the step, 31, passes the stud, it raises it, and causes the sweep to move on in the direction of the arrow, 33, and bring the catch, *x*, against the step, behind the sweep, fig. 1, to release the plate, J, and then carry the stud, *z*, down the incline, *u*, which draws down the plate, J, and brings the brush into a position for operating, as described. When the top of the step, 31, passes the stud, 18, the descending part comes into operation on it, and carries it down, depressing the rod, 21, and lever, O, and moving the sectors sufficiently to carry the sweeps back to their first described position, sweeping all the waste on to the cover of the doffer. During the latter part of this last described movement of the sweeps, the stud, *z*, travels along the incline, *t*, and raises the brush. The next movement of the cam is the same as that first described, and the succeeding operations of the machine are repetitions of those just explained.

More information may be obtained by letter addressed to the inventors.

Improvement in Railroad Cars.

We had the pleasure, a few days ago, of examining a new and beautiful car, recently put on the New York and New Haven Railroad, and constructed by Messrs. Bradley & Co., of Worcester, Mass. The improvement consists in the ventilating arrangements. The windows are so constructed that they are made to act the part of ventilators, by having two leaves, the front one is set to stand out, with its inner end forming the apex of a cone, the outside being the base. The air impinges on this window, as it is set angularly to the side of the car, and it therefore forms a partial vacuum at its outer edge. This draws the air from the inside and thoroughly ventilates the car, allowing nothing to come in from the outside. The other leaf of the window, is set behind the first leaf to sustain the current of air from the inside, to perpetuate the partial vacuum. There are ventilator cones in the roof, which prevent sparks from entering, but allow a fresh supply of air to enter the car continually. To keep railroad cars free from smoke and dust is a grand desideratum. The invention was explained to us by Mr. H. M. Paine. The improvement can be applied to the cars now in general use at a very trifling expense. We believe that upon a more extended trial than has yet been had, everything that is claimed will be accomplished, and that these cars will be almost universally adopted upon our railways.

Improved Hot-Air Register.

Mr. George Garrett, of this city (New York), has taken measures to secure a patent for an improvement in Hot-Air Registers, the nature of which improvement consists in operating the leaves of the Register by a slide, which works against one of the inner sides of the case, a horizontal screw or stud passing through an oblong slot in the slide. The leaves are placed longitudinally at the bottom of the case, and are attached to it by pins, which fit loosely in holes near the bottoms of two of the sides. These pins are placed in the centres of the leaves, so that the leaves work like Venitian blinds; each leaf has a lug on its upper surface near its ends, and a horizontal arm projects from each lug. These lugs work in two vertical slots in the slide. By moving the slide either backward or forward, the vertical slots act upon the horizontal arms, and these, being attached to the lugs on the leaves, they are entirely or partially opened or closed, as desired. A spring is attached to the slide, which bears against the side of the case, and keeps the slide, and consequently the leaves, in the desired position.

To Prevent Accidents on Railroads.

Mr. H. D. Taylor, of Newark, N. J., has taken measures to secure a patent for two improvements to prevent accidents on railroads. One relates to the construction of the cars, and the other to an improvement on the cow catcher. A frame is secured on elastic levers extending down close to the track, and on this the car is secured. The trucks are of the ordinary construction and are combined with this frame. The said frame rests on four small wheels independent of the ordinary running wheels. These small wheels are placed angularly and have broad grooved faces.—These bite upon the inner edge of the rails, therefore, although the running wheels were lifted up by an obstruction on the rails, the cars would be prevented from running off, as the small grooved wheels would still retain their hold upon the rails.

The cow catcher is so formed that it vibrates on an axis behind the front axle of the locomotive, and it has two india rubber bands on its front, which front rises or is lifted up when it meets with an obstruction, thus lifting it—the obstruction—from the track.

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Scientific American

NEW-YORK, DECEMBER 6, 1851.

Insecurity of Buildings.

Again and again have we called attention to the notorious fact, that the buildings in this city are generally inefficiently constructed, and that a strong and powerful remedy should be applied to make them more secure; in other words, that no buildings should be allowed to stand, that did not embrace the safety of their walls without leaving a single doubt on the subject. In vain has the public press uttered its denunciations against the legalized murders by falling walls and tottering ballustrades in our city. Scarcely a week passes over our heads without some terrible accident, by which many wives are left husbandless, and children left orphans.

Last week we noticed the death of two men and the severe injury of two others, by the falling of the walls of a brewery, in this city. The catastrophe was a melancholy one, although it paled in comparison with the lamentable destruction of the forty-three little children, in Ward School No. 26, as noticed by us in our last number. But had the falling of the wall spoken of taken place a few minutes earlier, when nearly twenty persons were in the building, there can be no doubt but the majority of them would now be slumbering with the clods of the valley. Can nothing be done to prevent such calamities? Are we still to go on chronicling accident after accident of this nature to the dull cold ear of unfeeling or weak administrators of executive justice? It appears so. It was once said by the London Times that "nothing would prevent railroad accidents in that country excepting the death of a Bishop." It may be that it will require the death of a President, a Judge, a noted Minister, Mayor, or some such influential and conspicuous citizen, before anything will be done—efficiently done, to stop such accidents. There can be no doubt but the guilt of many persons, in the eyes of community, has been clearly established in respect to the deaths of a number of people, by such accidents. No, we will not call them accidents—we call them crimes; and yet who has been punished—who will lay his finger on the guilty culprit now justly suffering for his misdeeds? Not one. Do not the ashes of those who perished by the Hague street explosion look up to heaven, with silent but sure intercession for justice upon those whose culpable recklessness immolated them beneath the crumbling walls and scoria of that flaming death-pyre?

On the twenty-second day of last January, six buildings in the course of erection in 21st street, this city, fell with a sudden crash, instantly killing five men, and wounding, more or less seriously, nineteen others. The Coroner's inquest developed the most astounding recklessness on the part of those engaged in their superintendence and construction. The width of the foundation was only fourteen inches; miserable mortar was used, and, worse than all, there was but one man employed on the party wall who could carry up a chimney. Has any thing been done to the guilty in that case? We believe not; we never heard there was. It is our opinion that there are more miserable workmen (or else they are very immoral in respect to executing good work), among our bricklayers (masons) than any other trade in our city. The majority of them seem to be boys of such years, that unless they are superintended by an honest and proficient mason, they are sure to make bad work. But the majority of superintendents—the bosses—are to blame, for they should not allow a bad piece of work to leave the hands of any of their men. They do not seem to care, however; they have an eye rather to the dollar than honest duty. There is scarcely a brick wall in any house in this city—an obscured one—but is made with joints through which Tom Thumb might play at "hide-and-go-seek." The bricks of inside chimneys are thrown together as with a pitchfork, and the mortar appears to have been valued, weight for weight, with California old dust. These things are a disgrace to the trade; bad work of any kind is a disgrace to any trade to which it belongs. There should be a reform, and a speedy one.

We feel sensitive on such a subject as this, for the honor of our workingmen is involved, in a great measure, in it, and whenever that is the case, we feel ashamed and humbled for our country and fellow men.

Amorphous Phosphorus.

It is well known that phosphorous is one of the most useful articles, as employed, in friction matches, which are now so indispensable to our comfort. Hitherto, to labor with this substance involved fearful diseases to those who, from necessity or interest, devoted themselves to work with it. It was also very difficult to transport, and its storage was a serious consideration, as it ignited at a summer temperature. All these difficulties respecting phosphorous are now removed by the splendid discovery of rendering it amorphous, which strips it of all its dangerous qualities, but deprives it of none of its useful properties. This effect is produced by a simple change in the arrangement of its atoms, and is a phenomena equally new and important to chemical science. Some friction matches made with amorphous phosphorous were exhibited at the Great Exhibition. The discoverer is Prof. Schrotter, of Vienna, and he is not without strong hopes of resolving some of the other elementary crystallized substances into a similar state. Liebig, in the last edition of his letters, ventures to suggest, upon the strength of this discovery, that many of the minerals composing the crust of this earth, may be but crystallizations of one and the same body.

Discoveries.

The discovery of a "perpetual motion" has long been a hobby with many men. Many have deluded themselves in pursuit of this phantom, for it is nothing else, and many knowingly have deluded others. An ignorance of principles—excepting by chance, as it were—always involves the certainty of making mistakes. A man thoroughly versed in the philosophy of mechanics never will spend a moment of time in inventing a machine, which, in any condition or under any circumstances, is to give out more mechanical power than the amount of force which propels it. This is an established law, for if a machine could give out more power than that which impels it, then that machine could move itself without the aid of any other power, which is impossible.

It is a great anomaly in our Patent Laws, that while they protect the application of a principle in mechanics, they afford no protection to the discoverer of a philosophic principle.

The inventor of the Electro Magnetic Telegraph did not discover a single philosophical principle of its operation, and yet its whole action and operation depends upon philosophical principles. When we look back only a few years, and see that Galvanism, Electro-Magnetism, Electrotyping, and the Daguerreotype, have been discovered, who can doubt, but that many other discoveries, equally as important and wonderful, will yet be made.

Whitelaw & Stirratt's Water Wheel---the Overshot at a Discount.

One of Whitelaw & Stirrat's water-wheels, manufactured at Cold Spring, N. Y., by Mr. Findlay, and embracing his improvement, was shipped from this city, last week, to Vera Cruz, from whence it is to go up the mountains to Miraflores, to the cotton factory there, of which Mr. Robertson, is agent. It is to take the place of a thirty-foot overshot. One of these wheels has been tried for the past six months, and so satisfactory has its performance been, that the second over-shot is to be removed, in order that the new wheel may take its place. The falls in Mexico are high, and the supply of water during some parts of the year, is very small; this re-action wheel is better adapted to meet these conditions, it seems, than the old over-shot.

The Woodworth Patent---Its Extension.

We understand that great efforts are to be made, during the coming session of Congress, to get this patent extended by another special act. It is our opinion that this cannot be; a most determined resistance and influence will be exerted against it; and, as we learn, the influence against it will be stronger than for it.

Gutta Percha Pens.

Among the most recent inventions, says an English paper, are gutta percha pens, which are stated to be far more durable than goose quills, and more available than the metallic materials. This appears to us to be a rational improvement. No metal pen can equal the goose quill except in retaining the writing point longer. Gutta percha pens will no doubt have the soft flexibility of the goose quill.

We would call attention again to the desirable invention of a pencil that would altogether answer the purpose of pen and ink; this would be one of the grandest discoveries of the age, because one of the most useful, and it would no doubt make the fortune of the inventor. We know a gentleman who pursued this subject for a long time, and on one occasion hit the mark, but he never was able to do so a second time. That it was done once is an evidence that it can be done again. Inventors, here is a subject for you.

Verdict of the Jury in the Greenwich Avenue Calamity.

Last Friday the Coroner's Jury closed its inquiry into the causes of the late calamity in Greenwich Avenue school. They condemned the construction of the stairs, that is, their plan, also the plan of having the doors open inwards. They attach no blame to the teachers, and but a shadow of blame to the constructors of the stairs. The verdict says, the children became suddenly alarmed by the illness of Miss. A. Harrison, got excited—unaccountably excited, by an impression that the house was on fire, and rushed out of doors. This, no doubt, was the primary cause of the mournful calamity. Respecting the stairs, the jurors' opinion—not verdict—is as follows:

"We would be understood then, not as condemning the good intentions or honest purposes of those designing the work, but the design itself, the structure as it left the hands of the master-mechanics, we do, in the most unqualified terms, pronounce to have been unsuited to the purposes designed, bad in their arrangement, at all times insecure and dangerous, and never properly and thoroughly secured by the builder. We regret most deeply the necessity of this latter remark."

Gas Light in Factories.

There are several manufacturing establishments in this country, which are illuminated in the evening by gas, made on the premises. This is without doubt more economical and far more convenient than any other mode of lighting, and would be more generally adopted but for indistinct notions of its use in cities, where its explosions and bad odors are common themes of remark. This, probably, is one reason why so few trouble themselves to inquire into the process of its manufacture or the practicability of its use on the small scale.

I am inclined to believe that the luxury of gas might easily be enjoyed in many of our country villages, especially in factory villages. In large establishments, particularly where steam power is used, what is to prevent the facile manufacture of coal gas enough for the concern and for the village around, with but little increase in the consumption of fuel? With an ordinary cast-iron gas retort, about 3,500 cubic feet of gas can be made per day—a quantity sufficient for a large factory and a small village. Could not the retort be arranged inside the fire place of the boiler, without any inconvience or increased consumption of fuel? Perhaps the employment of one extra hand in the fire room would be necessary. The amount of English coal required per annum would be small, while the refuse coke would be useful in making steam. In point of economy, is not coal gas about three times cheaper than oil or tallow? Mr. Editor, just ask some of your enterprising and ingenious readers to investigate this subject.

JOHN GO-AHEAD.

[A number of factories with which we are acquainted, and which a few years ago used oil exclusively, now use coal gas made on the premises. In coversation with an agent of a factory, about a month after the introduction of the coal gas, he said, 'I am surprised that we used the dirty oil lamps so long, they were more troublesome, dangerous, and expensive than gas by fifty per cent at least." It would not be possible to arrange the retort in the boiler furnace, as suggested above, nor would it be so convenient for changing the same. It is best to use two retorts, and we like the fire-clay kind the best; but these cannot be obtained at present, we believe. We hope those factories and villages which are yet revelling in the *darkness* of oil *light* will give attention to friend "Go-ahead."

The Proposed Exhibition at New York.

The proposal for holding an Industrial and Fine Arts Exhibition at New York, in the spring of next year, to which we have previously referred, appears to realize the best expectations of the projectors. Although no steps have yet been taken for ascertaining the number of persons in the United States who may wish to avil themselves of the opportunity of displaying the varied products of their industry, upward of one thousand applicants for space have already been received by the agents in this country, mainly from British and foreign exhibitors in the late Great Exhibition. We are informed that among the intending exhibitors are His Royal Highness Prince Albert, who has signified his intention of forwarding some of his farm produce, and the Duke of Devonshire, who contemplates sending various articles from his extensive collection of works of art. Baron Marochetti has engaged to execute an equestrian statue of General Washington; Mr. Carew a colossal statue of Daniel Webster, M. Monti is engaged in the production of one of his veiled figures, and Mr. Manning has consented to send his Prometheus, a statue of Her Majesty and Prince Albert, and several other articles of sculpture. The building in which the exhibition is to be held will, it is stated, cover an area of seven acres, and Sir Joseph Paxton is at present engaged in the preparation of a design which he intends to submit to the promoters of the undertaking. The 1st of February is the last day for receiving applications for space, and the Exhibition is expected to open on the 15th of April. Mr. Riddle, the American Commissioner, has returned to New York, where the experience which he has obtained in the management of affairs connected with the Great Exhibition will, no doubt, be brought to bear in making the necessary arrangements for the proposed transatlantic Exhibition.—[European Times.

[The above is something in which the European Times is far ahead of the American Times. The good people of New York are entirely in the dark about this new Crystal Palace. Some of our folk have been pulling the wool over the eyes of the people on the other side of the water. Nevertheless we would like to see such an exhibition, but we don't want one unless it is capable of cutting a figure.

Great Rat Trap.

Mr. J. H. Chester, of the city of Cincinnati, has taken measures to secure a patent for a very ingenious "rat trap." It is so constructed that when Mr. Rat enters and reaches forth to snatch the bait, his weight acts upon a spring trap door, which suddenly opens and precipitates him into a dark chamber, in which he can see only one speck of light, for that he rushes into another chamber, and by doing so sets the spring of the trap door by touching a lever, and in this manner the trap is re-set and kept set for any length of time by the animals themselves, so that without any trouble but to the rats, a whole box full may be caught.

Improved Stove.

Mr. Giles F. Filley, of St. Louis., Mo., has taken measures to secure a valuable improvement in Cooking Stoves, which consists in placing a chamber at the back and bottom of the fire grate, said chamber communicating with a flue underneath the oven. The object of the chamber is to equalize the heat around the oven, and this is done effectually by it, as the heat of the chamber passes into the flue under the oven, and the oven at that point, in ordinary stoves is the least heated, while the oven directly behind the grate is over-heated.

Geo. Peabody, Esq., the eminent American banker in London, has given $1,000 to the Maryland Institute, which is to be appropriated to the establishment of a chemical library and school.

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☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING NOVEMBER 23, 1851.

To E. B. Bigelow, of Clinton, Mass., for improvement in Wires for making Pile in Woven Fabrics.

I do not limit myself to any particular form or mode of attaching the weight, as this may be variously modified. But I claim combining with the flat pile or figuring wire, employed in weaving looped or piled fabrics, and attached to or near one thereof, a weight, for the purpose and in the manner substantially as described.

To Elias Howe, Jr., of Cambridge, Mass., for improvement in Fastenings for Garments.

I claim the opening, closing, and fastening together, the two sides of a garment, or other article, by means of the clasps and ribs, operating in combination, substantially in the manner described.

I also claim the method of connecting the clasps one to the other, in pairs, and in the series of pairs, by the links, cord, and beads, substantially in the manner set forth.

To H. H. Huntley, of Cincinnati, O., for improvement in Cooking Stoves.

I claim the driving flues opening from the floor, as described, and, in combination with this, the chamber, for the purpose described.

To Geo. W. Carleton, of Brunswick, Me., for improvement in Cooking Stoves.

I claim the employment of the three movable plates, constructed and arranged as described, viz., one of the plates being hollowed, affording a passage or flue, when not cut off by the damper through which the heat passes, warming the ovens formed by the plates, the plates being capable of being withdrawn from the stove, or varied in a vertical position, by which arrangement the stove can be converted into an air-tight or draught wood or coal cooking-stove, cooking range, or a wood or coal draught or air-tight radiating stove; or into a Franklin stove, substantially as set forth.

To Jonathan & John J. G. Collins, of Chester, Pa., for improved Safety Apparatus for Steam Boilers.

First, we claim the bent tube formed and arranged substantially as described, to contain mercury, in combination with the lever of the safety valve, or its equivalent, and connected with the steam boiler by means of a swivel and a pillar connection, or its equivalent, whereby the varying pressure of steam varies the actual weight upon the valve.

Second, we also claim the combination of the connecting rod and the lever, and the shaft for connecting the mercurial gauge, with the catch box, and the projection on the catch box, whereby the mercury in the gauge, being the weight, holds down the safety valve, or sets it at liberty, by the pressure of steam from the pillar and swivel, said pillar being supplied with steam from the boiler or boilers, as described.

Third, we also claim the combination of the rod with the spiral spring upon it, and a small pulley at the top of it, with the notched pulley for holding the catch box together, so long as the full part of the said pulley is on the small pulley, or setting it at liberty, when that part of the pulley that is cut out comes opposite the small pulley, and thereby allowing it to ascend, as described.

To Eijah Goldthait, of Fort Wayne, Ind., for improvement in Plows.

I claim, first, the cutter, or its equivalent, to separate the sward for the first furrow, at a proper distance from the coulter, acted upon by the prop and lever, or their equivalents.

Second, I claim the piece fastened to the heel of the mould board, in combination with the cutter to turn wide furrows.

Third, I claim the mode of connecting the tongue and plow, respectively, to the axle, by means of the link and the loose tenon on the tongue, substantially as described, so as to allow the team to walk entirely aside from the furrow or direct course of the plow, in plowing prairies, marsh, or other land with soft under strata, and make the plow run smoothly and work well; and so as also to enable the plowman to take an extraordinarily wide furrow, with one member of the team walking in the furrow, with a common yoke, thus dispensing with the long yoke now commonly used for that purpose.

Fourth, I claim the rope and lever, or their equivalents, in combination with the mode of connecting the tongue and plow to the axle, substantially as described and for the purposes set forth.

To Daniel King, of Brooklyn, N. Y., for improvement in Centrifugal Sugar Drainers.

I claim centrifugal machines for separating fluid from other matter, constructed and operating as set forth, with detachable vessels, containing the substance to be operated upon, irrespective of the exact mode of attachment, the number of vessels used, or the form.

To T. H Mortimer & J. M. Gardiner, of Charleston, S. C., for improved method of operating Rudders. Patented in France June 11, 1851.

We claim controlling the operation of the rudders, in such a manner as to bring either into operation while the other is stationary, by means of the sins or studds on their tillers, in combination with the grooves or slots in a wheel or disc, receiving motion upon an axis or by the equivalents of the same, substantially as described.

To Orrin Newton, of Pittsburgh, Pa., for improvement in the manufacture of Door Knobs.

I claim the combination and arrangement of the arms, sliding plate, springs, and lever, substantially as described, operating in the manner, or any analogous way, for the purpose set forth.

To Milo Peck, of New Haven, Ct., for improvements in Drop Presses.

I claim the general arrangement and combination of the crank and shaft, with its sweeps moving in the same direction with the moving gear or pulley, and the ratchet wheel, jointed together and running loose upon the shaft, constantly in the same direction, substantially as I combine them, for the purpose described.

I also claim the lock in combination with its sweep and springs, and with the crank, to stop its motion not too abruptly, and to hold it until it is unlocked, by the hand or foot of the workman, substantially as described.

To D. F. Phillips, of Republic, Ohio, for improvement in Cider Mills.

I wish it to be understood that I make no claim to originality of invention to any part of the mill, separately considered; nor do I claim as new any part of the arrangement of the press, grinding cylinder, or hopper. But I claim the arrangement of the parallel slicing knives, in combination with the reciprocating follower, made as described, with channels and ribs on its inclined face, when used with a grinding cylinder and concave, made and arranged as described, for first slicing the apples and then delivering the slices, successively, to the grinding cylinder, to be reduced to pumice in the manner described.

To Franklin Skinner, of Dunkirk, N. Y., for improvement in Shingle Machines.

I claim, first, the peculiar form and mode of adjusting the riving plate, the same being self-adjusting by means of the spring upon which it rests, and the end of the plate contiguous to the riving knife being bent upward, (to accommodate irregularities in the grain of the shingle timber), as specified.

Second, the employment in combination with a shingle shaving machine, of the rolls, levers, hanging rod, spring, and bent lever, or their equivalents, the whole being arranged and operated in the manner and for the purpose described; the levers, rod, and spring acting upon the rolls, and pressing them uniformly towards each other, for the purpose of unwinding or straightening the rived shingle in the first instance, and the bent lever (being operated by the motion of the connecting rod, and acting upon the spring) having the effect of increasing the force or pressure of the rolls upon the shingle (as the latter passes between them), for the purpose of preventing the splitting of the shingle, in advance of the cutters, as they approach the thin end of the shingle, as set forth.

To Wm. M. Smith, of Georgetown, D. C., for improved Valve for Oscillating Engines.

I do not claim the circular valve, nor the manner of reversing the engine by turning the valve. But I claim the arrangement of the piston valve, with a ground face, in a cylindrical steam chest, as described, by which the necessity of packing about the trunnion and plummer block is avoided, consequently saving much friction in the trunnion.

To F. A. Stevens, of Burlington, Vt., for improvement in Railroad Car Brakes.

I claim the combination and arrangement of the levers, link rods, and shoes, or rubbers, substantially as described, whereby each wheel of both trucks of a car is retarded with an uniform force, when the brake is put into operation.

RE-ISSUE.

To Solyman Merrick, of Springfield, Mass., for improvements in the Screw Wrench. Dated Aug. 17, 1835. Extended May 14, 1849. Re-issued Nov. 25, 1951.

I claim combining with a wrench, in which the inner jaw slides on a bar permanently attached to the outer jaw and making part of, permanently attached to the handle, substantially as described, a screw-thread and nut, connecting the movable jaw with the said bar between the said movable jaw and that part of the handle grasped by the operator, in the manner and for the purpose as described.

I also claim the arrangement of the screw upon the circular edges of the flat bar, in the manner and for the purpose described.

DESIGN.

To Ezra Ripley & N. S. Vedder, (assignors to Low & Hicks), of Troy, N. Y., for Design for a Parlor Stove.

Pneumatic Pile Driver.

A very excellent paper upon this mode of sinking piles was recently read before the English Association of Civil Enginers, by G. J. Hughes, C. E. The bridge erected upon the piles crosses the Medway at Rochester (Eng.)

The bridge was described, as being designed to consist of three large openings, a central one of 170 feet in width, and two others, each of 140 feet in width, spanned by cast iron segmental girders, and of a passage to admit masted vessels to the parts of the river, across which a movable bridge would be placed. Each of the river piers occupied an area of 1,118 square feet, and rested upon a series of cast iron cylinder piles, 7 feet in diameter, placed 9 feet apart longitudinally, and 10 feet transversely, so that there were fourteen under each pier. The cylinder piles in the abutments were 6 feet in diameter, of which the "Strood" abutment required thirty, and the "Rochester" abutment twelve. Each pile was composed of two, three, or more cylinders, 9 feet in length, bolted together through stout flanges; the bottom length had its lower edge bevelled, so as to facilitate the cutting through the ground. The bed of the river was originally presumed to consist of soft clay, sand, and gravel, overlaying the chalk, and accordingly the application of Dr. Pott's pneumatic method for forcing the cylinder piles into the ground, which had been successfully carried out in similar positions, was contemplated; but after a few trials, the ground was found to consist of a compact mass of Kentish rag-stone, so that the mere atmospheric action upon the piles, induced by a partial vacuum, would be ineffective in such a situation. It was therefore decided, that the pneumatic process should be reversed, so as to give each pile the character of a diving-bell; for which purpose one of the cylinders, 7 feet in diameter, and 9 feet in length, had a wrought iron bolt securely bolted to it, through which two cast-iron chambers, D shaped in plan, with a sectional area of 6 square feet, appropriately called air locks, projecting 2 feet 6 inches above the top of the cylinder, and 3 feet 9 inches below the cover. The top of each air lock was provided with a circular opening, two feet in diameter, with a flap working on a horizontal hinge, and an iron door, 2 feet by 3 feet 4 inches, with vertical hinges below the cover; each air lock was also furnished with two sets of cocks, the one for forming a communication between the cylinders and the chamber, the other between the chamber and the atmosphere. Compressed air was supplied to the cylinder pile by a double-barrelled pump, 12 inches in diameter, and 18 inches stroke, driven by a six horse-power non-condensing steam engine. At first the expelled water was made to pass into the river, from beneath the lower edge of the pile; but when the stratum became so compact as to oppose a high degree of resistance to the passage of the air, an outlet was formed through the side of the uppermost cylinder, by the introduction of a pipe, having the form of a syphon, the long leg of which reached to the bottom of a pile, and was subject to the pressure of the condensed air on the surface of the water within, whilst the short leg, leading into the river had the effect of relieving the amount of compression, providing a vacuum was once obtained in the body of the syphon. Such an effect was readily produced by connecting the summit with the exhaust side of the air pumps, by a pipe which could be opened or closed at pleasure. To insure the downward motion of the pile, and to give it a weight which should be at all times superior to the upward pressure, two stout-trussed timber beams were laid on the top of the cylinder, in a direction suitable for bringing the adjacent piles into action as counterbalance weights, by four chains passing over cast iron sheaves.

Two light wrought iron cranes were fixed inside the cylinder, the jibs of which swept over the space between the air locks and windlasses, inside, for the purpose of hoisting the loaded buckets and lowering the empty ones.

The method followed in working the apparatus was found to be so simple in detail as to be perfectly intelligible to all the workmen employed. The pumps being set in motion, the flap of one of the air locks and the door of the other were closed; a few strokes compressed the air within the pile sufficiently to seal the joints, and whilst the pumping was in progress, the men passed through the air locks to their respective stations. When the water was shallow, the pile descended, by scarcely sensible degrees, as fast as the excavation by hand permitted; but when the water was deep, the excavation was carried down full 14 inches below the edge of the pile, which then descended, at once, through the whole space, as soon as the pressure was eased off.

We wonder what has become of this invention in our country. It was illustrated in Vol. 5, Scientific American, and has been patented here; but we have heard nothing about it in a long time.

American Astronomers in Europe.

The Paris correspondent of the Boston Atlas says:—

"The names of the Messrs. Bond (father and son) have been again mentioned with honorable praise by M. Arago before the Academy of Sciences, when communicating to that body the observations of Mr. W. C. Bond and Mr. G. P. Bond who discovered a new ring in the interior of the old ring of Saturn. M. Arago observes, however, that as to the question of the unity or variety of Saturn's rings, no definite opinion can be formed until astronomers shall have observed stars in the black bands, which seem to mark the limits of the several rings, and this cannot be done until Saturn, which is placed 330 millions of leagues from the sun, shall pass over that way, where stars are so numerous. The astronomers of the Roman Observatory have remarked five or six rings around Saturn."

Castor Oil for Light.

The Jacksonville (Ill.) Journal says, it may not be generally known that castor oil is better for lamps than sperm or lard oil, which is the fact. Some years since, when this oil was cheaper than either of the others, the editors of that paper used it in their parlor lamps, much pleased with the result; it gives a white, clear and beautiful light, and does not clog the wick. It sells in Illinois at one dollar a gallon.

A marble statue of the late Chief Justice Tindel has been praced on the town pump of his native place, Chelmsford, Eng., an odd conceit, which provokes not a little merriment.

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TO CORRESPONDENTS.

A. F., of Mass.—Caveats can be renewed yearly by the payment of $20. Models are always necessary when application for a patent is made, where the invention admits of one.

L. V. B., of Ky.—We thank you for your attention. The process you describe is well known in this section, and is, we believe, generally pursued.

Y. G., of Del.—If you will carefully read our remarks, in Nos. 6 and 8, of this Vol., you will find explicit answers to each of your inquiries, therefore we deem it unnecessary to re-publish our remarks addressed personally to you. We have had correspondents write us for a private opinion upon some subject discussed and endorsed in the Scientific American, as though we were hired servants—victims entirely to the filthy lucre; no honesty as editors, but passibly decent as men. We do believe such fellows are either thick-headed, or would pick our collapsed pocket-book, if they had a fair chance.

S. H., of Ill.—We think well of the chain pump; it is simple and effective. The plan you entertain could not be patented.

N. B. L., of Md.—There is nothing patentable in your plan for grinding apples; it is the same in principle as Beal's Corn and Cob Crusher. Blanchard's machine for turning spokes is a good one; A. K. Carter, of Newark, N. J., is the agent to apply to.

W. J. F. S., of Ill.—The plan of your wagon-wheel is new, and doubtless patentable. You can send us a model.

C. M., of N. Y.—We suppose a patent on the design of the ornamental tree box could be patented, or upon the mode of coupling, if new. To decide this point we should require a drawing or a model.

E. B. R., of Ky.—We do not know of any machine in use for sawing geometrical stair rails, but Cochrane's machine for sawing ship timber could do it. The carved moulding for chairs and other furniture is done by hand; but there are carving machines, such as that of Mr. Singer, which can carve the like. Machines for cutting mouldings, we suppose you are acquainted with.

T. H. J., of N. Y.—We had considerable difficulty in making out your proper address, as there are several Fayettevilles in this country: our correspondents are many times very careless about giving the town and State in which they reside, and, in consequence we are subject to much inconvenience.

A. H., of Mo.—Your roof appears to be very good, and we do not know of another like it; the form however, is like that of the old tile roof. We like to have the chalk in the cellar to generate the carbonic acid, for it is easier to conduct it upwards than downwards.

J. P. S., of N. Y.—Theoretically, any of the common water rams will raise water by a ten foot fall fifteen feet high—two-thirds of the water. In Ewbank's Hydraulics, it is not stated how high the head of the water ram column was; perhaps it was taken from one of the falls on the Rhine—the statement, however, appears to be too highly colored.

W. P. B., of Ala.—The roofs you speak of must be good. We have some of the same kind here, only instead of the bricks, fine gravel is used; it would not answer for a pavement in this city, however, for we have seen it tried with a top covering of blocks, and it did not stand so well as the Russ pavement; in some parts we believe it would answer well, but it is not patentable.

D. R., of N. C.—We believe that the Camel Steam Tug is both a rational, practical, and good invention. To test the matter, the first tug should be well built in every respect; we have seen a good invention condemned for want of care in the first experiment; it will be a useful vessel in many places, but in every harbor of any note, one or two good dredge boats should always be employed. All our dredge steamboats are miserable affairs; we have not a single good one here.

H. M., of Vt.—We shall publish the engraving of your plane as soon as we can reach it. Your second letter is received; there may be minor differences in the two arrangements referred to.

W. J. D., of Ind.—A small engine of the size you specify, can be had of Hoard & Bradford, of Watertown, Jefferson Co., N. Y., at a reasonable price.

L. P. S., of Ct.—A work upon metals was published not long ago, by H. C. Baird, of Philadelphia, but it does not treat upon the points you speak of, and we do not know of any good publication that will suit your wants. The art of polishing and burnishing metals is acquired by practice.

Money received on account of Patent Office business for the week ending November 29.

D. A. B., of Ill., $20; L. & C., of Ohio, $25; H. H., of Ct., $12; G. & P., of Mass., $55; J. A. R., of Mo., $50; H. S., of N. H., $30; M. R. L., of Miss., $30; H. D. T., of N. J., $27; S. R., of Md., $20; G. G., of N. Y., $15.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Nov. 29:—

N. H. L., of S. C.; H. H., of Ct.; D. A. B., of Ill.; C. B. M., of N. Y.: W. McC., of N. Y.; A. S., of Pa.; E. L. N., of Mass.; C. J. B., of N. H.

The good citizens of Buffalo N. Y., can obtain the Scientific American, at T. S. Hawk's Literary Depot, Post Office.

Sending Receipts.---Postage on Books.

The Post Office Laws do not allow publishers to enclose receipts; when the paper comes regular subscribers may consider their money as received.

Subscribers ordering books or pamphlets are particularly requested to remit sufficient to pay postage.

An Important Paragraph.

To preclude subscribers the necessity of writing for back numbers of the Scientific American, we shall forward all the back numbers of Volume 7, dating their subscriptions from the commencement unless they instruct to the contrary. We shall send the back numbers issued on this Volume until No. 13, after that time the names will be entered from the date of the reception of orders, unless the writer expresses a wish to receive the back numbers.

Whenever our friends order numbers they have missed—we always send them if we have them on hand. We make this statement to save time and trouble, to which we are subjected in replying when the numbers called for cannot be supplied.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2 and 3—none.

Of Volume 4, about 20 Nos.; price 50 cts.

Of Volume 5, all; price, in sheets, $2; bound, $2,75.

Of Volume 6, all price in sheets, $2; bound, $2,75.

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One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

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American and Foreign Patent Agency

IMPORTANT TO INVENTORS.---The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

BILLINGS PATENT BAND WRENCH, for Wagons and Carriages.—This article is fully described and illustrated by engravings in No. 7, Vol. 7, of the Scientific American. The Patent Band Wrench applies to wagons and carriages where the common or square nut is used. They are perfectly tight and prevent all dust and dirt from reaching the axle. The wheel is taken off by means of a small pocket key. A Silver Medal was awarded this article by the American Institute at their late Fair in this city. The Bands are manufactured by the Patent Band Wrench Co., located at Claremont, N. H. Smith Van Horn & Co. are the agents for this city. Orders addressed them, as above, will meet with prompt attention. A. M. BILLINGS,
12tf General Agent for the Co.

ENGELBRECHT & HOOVER, No. 257 Broadway, (Opposite the Park), New York, in the business of a general Patent Agency, and matters connected with the purchase and sale of inventions and patents. At the above establishment any acknowledged good invention, or Letters Patent, can be purchase or sold for any portion of the United States or Europe. 12 4*

A. B. WILSON'S SEWING MACHINE, justly allowed to be the cheapest and best now in use, patented November 12, 1850; can be seen on exhibition at 195 and 197 Broadway (formerly the Franklin House, room 23, third floor), or to E. E. LEE & Co., Earle's Hotel. Rights for territory or machines can be had by applying to GEO. R. CHITTENDEN,
12 2* Agent.

LOGAN VAIL & CO., No. 9 Gold street, New York, agents for George Vail & Co., Speedwell Iron Works, have constantly on hand Saw Mill and Grist Mill Irons, Press Screws, Bogardus' Horse-Powers, and will take orders of Machinery of any kind, of iron and brass; Portable Saw-mills and Steam Engines, Saw Gummers of approved and cheap kind, &c. Gearing, Shafting, large and small, cast or of wrought iron. 11tf

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WANTED—By a middle-aged man, a situation where he could make himself generally useful by book-keeping, drawing machinery and architecture, with a house or engine builder, or railroad constructor, or in a factory of any description; and could teach drawing and French. Has no objection going to any part of the Union. Direct answer to E. B. French, Chatham Square Post Office, N.Y. 11 3*

THE SATURDAY EVENING POST, THE Leading Literary Weekly in the Union.—The proprietors think it unnecessary to dwell upon the distinguishing features of the "Post," whose brilliant success, during an existence of thirty years, is a sure guarantee of the future. For the coming year we have made arrangements for the following nouvellets:—"Eoline, or Magnolia Vale," by Mrs. Caroline Lee Hentz, author of Linda, Rena, &c.; "Trial and Triumph," by T. S. Arthur, author of The Iron Hand, Temperance Tales, &c. &c., &c. The "Post" will also contain, weekly, choice selections, news, bank note list, state of markets, &c. Terms—Single copy, $2 per year, or three years for $5, in advance. Clubs (to be sent to one P. O.), 4 copies, $5; 9 copies, $10; 14 copies, $15; 21 copies, $20, in advance. Address always post-paid. DEACON & PETERSON, 66 south 3rd st., Philadelphia. A copy of the "Post" will be sent as a specimen to any one. 10 5

BALLOONS.—I am prepared to manufacture Hydrogen Balloons of from 1 pound to 50,000 lbs. ascending power to order. Balloons capable of carrying up one or two persons always on hand. The Balloons will be of the most perfect construction, so that any person can, with certainty and safety ascend with them. Instructions to insure success given to purchasers gratis. JOHN WISE, Lancaster, Pa. 9 10*

TRAUTWINE ON RAILROAD CURVES.—By John C. Trautwine, Civil Engineer, Philadelphia; just published and for sale by WM HAMILTON, Actuary of the Franklin Institute Price $1.

"This is a really good work, and we heartily recommend it to our civil engineers."—[Scientific Am.

"We have carefully examined this work, and regard it as the best that has yet appeared on the subject," &c.—[Am. Railroad Jour. 8 10*

POST'S PATENT SLIDING DOOR FRONTS—For Stores and Public Buildings; a new, cheap, and simple fixture for securing store fronts, which renders them fire and burglar proof, has been invented and patented by the subscriber, who is now prepared to sell rights. Messrs. Quarterman & Son, 114 John st., N. Y., are general agents. Address (post paid) Wm. POST, Architect, Flushing, L. I. 6 3m

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TILTON's Patent Violin.—The undersigned having patented his Violin Improvement, is prepared to exhibit it to the public. Being now in New York, he may be found at No. 18 Park Place (Mr. J. Wiley's), where he will be pleased to see such gentlemen as take an interest in his invention. All communications addressed "Wm. B. Tilton & Co.," as above, or at Carrolton, Pickens Co., Ala.
3 12* WM. B. TILTON.

LEROW & BLODGETT'S PATENT ROTARY SEWING MACHINE.—The undersigned, having purchased the right to use, sell, and manufacture these machines for the States of Alabama and Mississippi, and their other business engagements preventing them from giving it their personal attention, they are disposed to sell out their right to the above-mentioned States, or counties in them, if preferred, upon favorable terms. To an energetic and industrious man we will sell upon such terms as will insure a large and handsome profit. Apply to Mr. W. SCRUGGS, of the firm of Messrs. Scruggs, Drake & Co., Charleston, S. C., or to WM. MAILLER, Decatur, Ala. 4 8*

PROFESSOR ALEX. C. BARRY'S TRICOPHEROUS OR MEDICATED COMPOUND.—Professor Barry does not hesitate to put his Tricopherous, for the two grand requisites of efficacy and cheapness, against any preparation for cleansing, renewing, preserving, and strengthening the Hair, that has ever been advertised or offered for sale. He challenges the associated skill and science of the medical world to produce, at any price, an embrocation that will reduce external irritation, cure ordinary cutaneous diseases and severe cuts, sprains, pains, &c. Sold in large bottles, price 25 cents, at the principal office, 137 Broadway, New York, and by the principal merchants and druggists throughout the United States, Canada, Mexico, West Indies, Great Britain, France, &c. 4 12*

CLOCKS FOR CHURCHES, PUBLIC BUILDINGS, RAILROAD STATIONS, &c., and REGULATORS FOR JEWELLERS.—The undersigned having succeeded in counteracting effectually the influence of the changes of the temperature upon the pendulum, and introduced other important improvements in the construction of clocks, are prepared to furnish an article, superior in every respect (the highest grade warranted to vary less than two minutes in a year) to any made in the United States. Ample opportunity will be afforded to test their qualities. Glass (illuminated) dials of the most beautiful description furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island, N. Y.

"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world."—[Scientific American.

"Mr. Byram is a rare mechanical genius."—[Jour. of Commerce. 5 10

PATENT CAR AXLE LATHE—I am now manufacturing, and have for sale, the above lathes; weight, 5,500 pounds, price $600. I will furnish a man with each lathe, who will turn and finish axles for 50 cents each, if desired. I have also for sale my patent engine screw lathe, for turning and chucking tapers, cutting screws and all kinds of common job work, weight 1500 lbs., price $225. The above lathe warranted to give good satisfaction. J. D. WHITE, Hartford, Ct. 7 6m*

MACHINERY FOR SALE—Four dead spindle filling frames, 1-16 strand speeder, 1 warper, 1 lapper, &c. Also turbine water wheels, 6 ft. diameter, of most approved patterns, at $275 each; a breast wheel, &c.; 20 feet long, and an iron under-shot water-wheel. ELI WHITNEY.
New Haven, Oct. 22, 1851. 7 6*

IRON FOUNDERS MATERIALS—viz.: fine ground and Bolted Sea Coal; Charcoal, Lehigh, Soapstone and Black Lead Facing. Iron and brass moulding sand; Fire Clay, Fire sand and Kaolin;—also English, Scotch and Welsh Fire Bricks—plain arch, circular and tower cupola—for sale by G. O. ROBERTSON Liberty place, between 57 and 59 Liberty-st. (near the Post Office) N. Y. 7 12*

A CARD.—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers and manufactures of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools; also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style—which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN Importer of Watchmakers' and Jewellers' Files and Tools and manufacturer of Mathematical Instruments 154 Fulton st. 6 9*

THE SUBSCRIBER has on hand several improved Steam Engines of superior quality, and made of the best materials, particularly adapted to manufacturing, saw mills, flour mills, &c. He will also make to order, at the shortest notice, engines and boilers of from 2 to 50 horse power, with all their appendages; prices reduced. Also, shafting, mill gearing, saw mills, presses, drills, &c. He has also facilities for furnishing lathes, planes, and scroll chucks, of the most approved styles and patterns, at short notice. Chain pumps always on hand, wholesale and retail, at No. 4 Howard st., New Haven, Ct.
10 7* AARON KILBORN.

1851 TO 1856.----WOODWORTH'S PAtent Planing Machines.—Ninety-nine hundredths of all the planed lumber used in our large cities and towns continues to be dressed with Woodworth's Machine. Price of the machine from $150 to $760. For rights in the unoccupied towns and counties of New York and Northern Pennsylvania, apply to JOHN GIBSON, Planing Mills, Albany, N. Y. 9 10*

JOHNSON'S UNEQUALLED SAW GUMMER for gumming out the teeth of saws, an article indispensible for saw mill owners. This article has been thoroughly tried and well approved, for sale by G. A. KIRTLAND, 205 South street, New York. 9 4*

SCRANTON & PARSHLEY, Tool Builders, New Haven, Conn., have on hand six 12 ft. slide lathes, 28 in. swing; also four 8 ft. do.; 21 in. swing, with back and screw gearing, with all the fixtures; one 5 ft. power planer; 12 drill presses, 4 bolt cutting machines, 30 small slide rests; 5 back geared hand lathes, 21 in. swing; 15 do. not geared; 8 do. 17 in. swing on shears 5 1-2 feet; 25 ditto with and without shears, 13 in. swing; counter shafts, all hung if wanted suitable to the lathes. Scroll chucks on hand; also index plates for gear cutting. Cuts of the above can be had by addressing as above, post-paid. 9tf

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BEARDSLEE'S PATENT PLANING MAchine, for Planing, Tonguing and Grooving Boards and Plank.—This recently patented machine is now in successful operation at the Machine shop and Foundry of Messrs. F. & T. Townsend, Albany N. Y.; where it can be seen. It produces work superior to any mode of planing before known. The number of plank or boards fed into it is the only limit to the amount it will plane. For rights to this machine apply to the patentee at the abovenamed foundry—or at his residence No. 764 Broadway; Albany. GEO. W. BEARDSLEE. 5tf

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WATTS & BELCHER, Manufacturers of Steam Engines, Lathes, Planing Machines, Power Presses, and Mechanics' Tools of all descriptions. Orders respectfully solicited and punctually attended to. Washington Factory, Newark, N. J. 7 20*

PAINTS, &c. &c.—American Atomic Drier, Graining Colors, Anti-friction Paste, Gold Size, Zinc Drier, and Stove Polish.
QUARTERMAN & SON, 114 John st.,
9tf Painters and Chemists.

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Morticing and Tennoning machines; Belting; machinery Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 1tf

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LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers—from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England Scotland, France and Germany—for Locomotive Marine and other steam Engine Boilers.
THOS. PROSSER & SON, Patentees,
1tf 28 Platt-st. N. Y.

MALLEABLE IRON FOUNDRY, EASTON, Mass.—The subscriber continues to manufacture castings of every variety, for machinery and other purposes, of the best quality, at the above establishment, we have facilities for making castings 5 1-2 feet in length. Persons wishing castings can send patterns to Easton Express, Boston, Mass. All letters will be promptly attended to.
8 10* DANIEL BELCHER.

WOOD'S IMPROVED SHINGLE MACHINE—Patented January 8th 1850, is without doubt the most valuable improvement ever made in this branch of labor-saving machinery. It has been thoroughly tested upon all kinds of timber and so great was the favor with which this machine was held at the last Fair of the American Institute that an unbought premium was awarded to it in preference to any other on exhibition. Persons wishing for rights can address (post-paid) JAMES D. JOHNSON, New Haven, Ct.; or WM. WOOD, Westport; Ct., All letters will be promptly attended to. 37tf

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LEONARD'S MACHINERY DEPOT, 109 Pearl-st. 60 Beaver N. Y.—The subscriber is constantly receiving and offers for sale a great variety of articles connected with the mechanical and manufacturing interest, viz.: Machinists' Tools—engines and hand lathes; iron planing and vertical drilling machines; cutting engines, slotting machines; bolt cutters; slide rests; universal chucks &c. Carpenters' Tools—mortising and tennoning machines; wood planing machines &c. Steam Engines and Boilers from 5 to 100 horse power. Mill Gearing—wrought iron shafting; brass and iron castings made to order. Cotton and Woolen machinery furnished from the best makers. Cotton Gins; hand and power presses. Leather Banding of all widths made in a superior manner; manufacturers' Findings of every description. P. A. LEONARD. 10tf

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MANUFACTURE OF PATENT WIRE Ropes and Cables—for inclined planes, suspension bridges, standing rigging, mines, cranes, derick, tillers &c.; by JOHN A. ROEBLING; Civil Engineer—Trenton N. J. 47 1y*

RAILROAD CAR MANUFACTORY—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty, and good taste, as well as strength and durability, we are determined our work shall not be surpassed. JOHN R. TRACY,
39tf. THOMAS J. FALES.

BEST CAST STEEL AXLES AND TYRES, (a new article,) for Railroad Carriages and Locomotives. The quality of this steel is sufficiently attested in the announcement that it has carried off the first prizes awarded at the World's competition of 1851, in London. The axles are in general use on the Continent, and are now offered in competition with any other that can be produced; and to be tested in any way that may be desired by the engineers of the United States, either by impact or by torsion. This steel is manufactured by Fried Krupp, Esq., of Essen, in Rhenish Prussia, represented in the United States by THOS. PROSSER & SON, 28 Platt st., N. Y.
2tf.

TO ENGINEERS.—A new Work on the Marine Boilers of the United States, prepared from authentic Drawings and Illustrated by 70 Engravings—among which are those of the fastest and best steamers in the country—has just been published by B. H. BARTOL, Engineer, and is for sale at the stor of D. APPLETON & CO.,
1 12* 200 Broadway.

MCCORMICK'S PATENT REAPERS AND MOWERS.—1700 of these machines, for which the great Medal of the World's Fair was awarded, are being manufactured at Chicago, Ill, with the intention of supplying the South-eastern States for the next harvest The gold medal of the Chicago Institute was recently awarded for this Reaper and Mower, tested against two other mowers, in cutting prairie grass; and the first premium of the State Agricultural Societies of Wisconsin, Michigan and Pennsylvania, were also awarded at their late Fairs. Price $120 at Chicago, and $122 delivered at Philadelphia; terms otherwise accommodating. 9tf

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SCIENTIFIC MUSEUM.

A Curiosity.

The Savannah Georgian, of a late date, notices the receipt of beautiful specimens of the date grown by Mr. William Audley Couper, on his place upon St. Simon's Island, Glynn county, Georgia, and which is believed to be one of the first instances in which this fruit has been grown in perfection in this country. The Georgian says:—

The tree bore fruit this year for the first time, and has six or seven bunches, similar to the one now to be seen at our office. Mr. Couper has a number of other trees, but none so old as the one now bearing. The palm-tree which bears the date does not usually bear fruit under the age of thirty years, and it is said that they bear seventy years before they begin to decline. As an article of commerce, the date made into a paste called *adjou* for export, and the oil manufactured and known as palm-oil, form a considerable and valuable article of export. The import of the oil alone into Great Britain, in 1832, amounted to upwards of one-and-a-half-millions of dollars. Why we may not in time raise the date as an article of consumption and export, in the southern part of the United States, Georgia and Florida particularly, will be only because we are too much wedded to the one idea of raising cotton.

Screw Propeller for the Navy.

The London Nautical Standard contains an excellent article on the application of the screw to war vessels, which should receive the marked attention of our Naval Board. It says:—

"Steam is yet in its infancy—the screw is doomed before long to assume the most important place in a naval armament—the paddle is not without its peculiar advantages; and yet who can pronounce either that the one or the other is in such a condition as to satisfy the exigencies of war purposes, or who can deny that there is a wide field open for mechanical improvement in the application of steam as the means of locomotion to ships intended for warlike purposes.

The Board of Admiralty would do well, while the leisure of peace permits them, to calculate calmly the contingencies of the future, to give every encouragement to the contributors of practical improvements in the art of navigation and seamanship, and more especially to that class of men who are the best qualified by their experience to offer suggestions for the improvement and better adaptation of steam as the means of propulsion. The paddle, in its most improved form, can never survive the ordeal of a naval contest; and the screw, although it is open to less objection, is not free from great defects, which would soon become apparent under a severe trial. That the latter instrument must supersede all other means of propulsion is scarcely open to any doubt; it therefore behooves us to lose no time in testing the extent of capability of this important element of power; at the same time ascertaining by what means it may be adapted to ships of war, so as to render it in the greatest degree impregnable in warfare, and that without prejudice to the strength and other necessary qualities of a man of war.

Gold Solder.

Messrs. Edilors—I send you a receipt for Gold Solder, which dentists and jewellers will find very valuable; I have been using it several years:—

No. 1—4	parts gold,	3	silver,	1	copper,	½	zinc.
No. 2—3	do	3	do	1	do	½	do.
No. 3—2	do	3	do	1	do	½	do.
No. 4—1	do	1	do			1	do.

It is not as generally known as it should be, that case-hardening may be affected in a minute, or less, by some of the preparations of potash, even better than in an hour by the old process of cementation. I use pounded prussiate of potash and charcoal in about equal quantities, heat the iron to a very low red, wallow it in the pulverized coal and potash, then heat to a cherry red, and chill in water, and the iron will be hardened as deep as by an hour's cementation. The prussiate of potash alone will do, but I think not so well.

By the way, why is it that potash will convert iron into steel? It is generally supposed that it is carbon that effects the change.

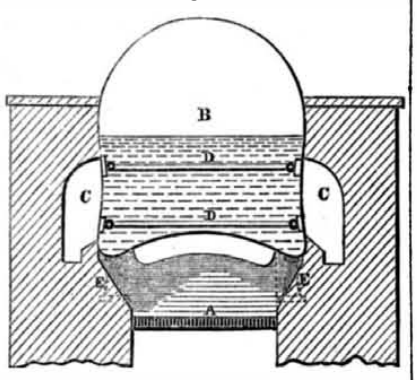
D. J. Wells.

Bolivar, Tenn., 1851.

[The prussiate of potash is very different from potash—it contains carbon, nitrogen, and potash. It is also well known that cast-iron contains more carbon than wrought-iron. The chemical combinations are only matters of fact; we cannot tell the reason why one substance, in uniting with another, produces a new effect, we only can tell how they act and what they produce, and this knowledge is obtained solely by experiment.—[Ed.

On Boilers.---No. 3.

Fig. 4.



Enlarging the Furnace and Lightening the Wagon Boiler.—When a wagon boiler is found to have insufficient power, it frequently admits of a very effectual remedy by lengthening the fire bars; and when the seating walls are unnecessarily thick, by widening the boiler throughout. A great portion of the brickwork on each side may be removed by supporting the boiler on 6 or 8 cast-iron blocks or short columns, and with merely a brick in breadth wall to divide the flame bed and furnace from the side flue.

When this plan is done carefully, it is always followed by a great increase in the evaporating power of the boiler, without requiring any great addition to the area of the fire grate.

A is the furnace; B is the boiler; C C are the flues; D D the braces; E E are cast-iron columns.

In effecting this alteration care must be taken that the enlargement of the fire grate does not injure the draft, otherwise a contrary effect to that expected has sometimes been produced, particularly where the chimney is small and no surplus draft at command. In such a case it is necessary to diminish by a small amount some of the spaces between the grate bars, in order that the total area of draft space may not be increased in so great a proportion as the area of the grate itself. The easiest way to effect this is to chip off one side of the grate, leaving the largest draft spaces towards the centre of the fire; and if there are two lengths of bars, confine the operation to the first length, by which means the combustion will be more rapid where otherwise the coals are apt to accumulate.

It has been already remarked that the evaporating power of a boiler is always found to be, other things remaining the same, in proportion to the area of the fire grate; and to this may be added, the evaporative economy of a boiler is always much increased by any increase of heating surface immediately over or very near the fire, the area of the fire grate itself remaining the same, or in some cases even diminished.

There is another fact connected with this part of the subject which must have struck any one who has been at any considerable pains in making observations, which is, that the heating surface very near to, or over the fire grate is so much more effective than those portions of the boiler which are beyond the occasional reach of the flame, as scarcely to admit of any comparison. Certain, it is, that 2 or 3 square feet of additional surface over the hottest part of the fire grate makes a considerable improvement in the power as well as in the economy of a boiler, while as many square yards of surface added to the contrary end has scarcely any perceptible effect at all, provided that the proportions of the boiler in other respects remain the same. It has been found that when boilers of 20 feet long have been lengthened by 10 feet, the addition has made scarcely any difference in the evaporating power, while the fire grate remained the same, and the saving of fuel, if any, has only been very trifling.

Gold from Australia.

Accounts from New South Wales to the 18th August have been received in London, giving the most flattering accounts both as to the quantity and quality of the gold round about Bathurst. Sydney was said to be almost deserted. The receipts per week into the town were said to reach £20,000 ($97,000) to £25,000. The Government armed escort brought £10,000.

The steamer Severn arrived at Southampton the 13th, with the mails from Australia and New Zealand to the 18th August. She brought two packages of diamonds valued at £28,000.

The Sydney News states that gold is most plentiful in Fredrick Valley, and that the gold-diggers are making rich harvests. Lumps of gold, from twelve to fourteen pounds in weight had been found The Express states that two men in Frederick Valley produced £250 pounds worth of gold in two days. The gold is found in large quartz veins, and an immense quantity has been received at Bathurst. A mail is to run daily between Sydney and Bathurst.

Thus it seems that the produce of Australia gold is getting to be nearly as great as that of California; while diamonds are not unfrequently found. What is to be the end of this? a depreciation of the value of gold. It certainly has that appearance at present.—Well it will do no harm to the world; that is impossible, it will do good. We wish that platina was as plentiful, as it is one of the most useful metals in the arts, perhaps the most useful. The day may not be far distant when every republican will come into the world with a gold spoon in his mouth; this certainly would throw all the patrician class into the shade, as silver spoons only were claimed for them.

What may be Done with Old Rags.

There is a church actually existing, near Bergen, Germany, which can contain nearly one thousand persons. It is circular within, octagonal without. The relievos outside, and the statues within, the roof, the ceiling, the Corinthian capitals, are all of papier-mache, rendered water-proof by saturation in vitriol, lime-water, whey, or the white of eggs. We have not yet reached that pitch of audacity, in our use of paper, but it should hardly surprise us, inasmuch as we employ the same material in private houses, in steamboats, and in some public buildings, instead of carved decorations and plaster cornices. When Frederick II., of Prussia set up a limited papier-mache manufactory at Berlin, in 1765, he little thought that paper cathedrals might, within a century, spring out of his snuff-boxes, by the sleight-of-hand of advancing art.

Structure on Piles.

Rule for calculating the weight that can be safely trusted upon a pile which is driven for the foundation of a heavy structure. By John Sanders, Bret. Majo U. S. Eng.:—

A simple empirical rule, derived from an extensive series of experiments in pile driving, made in establishing the foundation for Fort Delaware, will doubtless prove acceptable to such constructors and builders as may have to resort to the use of piles, without having an opportunity of making similar researches. I believe that full confidence may be placed in the correctness of this rule, but I am not at present prepared to offer a statement of the facts and theory upon which it is founded.

Suppose a pile to be driven until it meets such an uniform resistance as is indicated by slight and nearly equal penetrations, for several successive blows on the ram; and that this is done with a heavy ram, (its weight at least exceeding that of the pile,) made to fall from such a height that the force of its blow will not be spent in merely overcoming the inertia of the pile, but at the same time not from so great a height as to generate a force which would expend itself in crushing the fibres of the head of the pile. In such a case it will be found that the pile will safely bear, without danger of further subsidence, "as many times the weight of the ram, as the distance which the pile is sunk the last blow, is contained in the distance which the ram falls in making that blow, divided by eight." For example, let us take a practical case in which the ram weighs one ton and falls six feet, and in which the pile is sunk half an inch by the last blow; then as half an inch is contained 144 times in 72 inches, the height the ram falls, if we divide 144 by 8, the quotation obtained, 18 gives the number of tons which may be built with perfect safety, in the form of wall, upon such a pile.

[The above is from the journal of the Franklin Institute; the value and importance of this rule cannot be too highly estimated by our civil engineers..

Submarine Telegraph.

The newly constructed submarine telegraph between France and England, is about to be put to an important scientific use. Professors Arago, Babbinet, and the Abbe Moigne, of Paris, have arranged with Mr. Brett, to open a communication with Professor Airy, to connect the wires on each side of the Channel, with the observatories at Paris and Greenwich, for instantaneous observations. A game of chess, likewise, between four of the most celebrated players in Paris and London, respectively, is about to be undertaken by means of the submarine telegraph.

A Roman mosaic pavement of great beauty has been brought to light at Aumale, one of the French colonies in Algiers. It is a picture of Bacchantes.

Mr. Young, of Manchester, Eng., has succeeded in solidifying gas—a result which Liebig said, some time ago, was "one of the greatest wants of the age."

LITERARY NOTICES.

Graham's Magazine, for December, is exceedingly well illustrated, and the contributions are of a varied and sterling character. This number closes the volume, and offers a favorable time to snbscribe. We wish our friend Graham a large and increased list of paying friends. Dewitt & Davenport are the New York agents.

Sartain's Magazine, for December, has been sent us by Messrs. Dewitt & Davenport. A better magazine than this is not published; the number before us contains several fine and spirited engravings and an able list of contributions. A new volume commences with the next number.

Practical Model Calculator.—We have received No. 4 of this work, edited by Oliver Byrne, and published by Henry Carey Baird, Philadelphia. The contents of this number relate to calculations of the Steam Engine and Boiler; this takes in the locomotive, the nature of steam, strength of materials, the centripetal and centrifugal forces, &c. This work is of great importance to mechanics and engineers.

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